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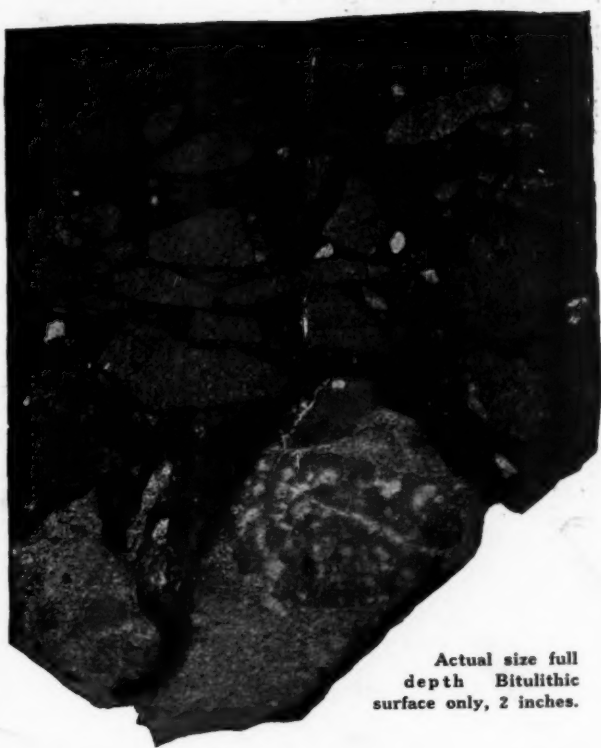
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Municipal Journal

Volume XLIII

NEW YORK, AUGUST 16, 1917

No. 7

CONCRETE PAVING ON CONNECTICUT HIGHWAY

Sand Hauled During Previous Winter—Elevating Loaders and Bins Used in Loading Trucks and Industrial Cars—Economizing By Use of Industrial Railway—Other Appliances Used.

Very complete equipment is being used and a minimum of labor employed in the construction of a 2-mile stretch of concrete road near Torrington, Conn. Materials are hauled by motor truck and industrial railway and most of the grading is done by means of a road grader. Sand and stone are loaded, hauled and dumped entirely by machinery. About 35 men are on the payroll and the work is progressing at the rate of about 300 feet of finished road a day. The paved portion is 18 feet wide, 6 inches thick at the sides and $8\frac{1}{4}$ inches at the center, and is laid in a single course.

The old road was of gravel and had to be changed in grade only slightly. It was first scarified, the curves straightened, small hollows filled and about three inches removed from the crown. Some hand work was necessary in the filling and straightening, but most of the material was moved by an Acme road grader, drawn by a steam roller. This scraped the excess material toward the ditches (where it was later available for making shoulders) and left a flat sub-base which, when rolled, formed the foundation for the road.

Sand was obtained from a local pit about three miles from the road. Most of this was hauled during the winter, as the contract had been awarded the previous fall and teams and motor trucks were kept hauling at odd times during the winter. The sand was dumped along

the road at points where it would not interfere with traffic and where it would not wash badly. When construction work was begun, some of the sand had to be redistributed, but the amount was comparatively small.

For loading the sand into the truck, a portable home-made elevating loader was devised. This consisted of an elevator from a stone crusher, mounted on a suitable frame and driven by a gasoline engine.

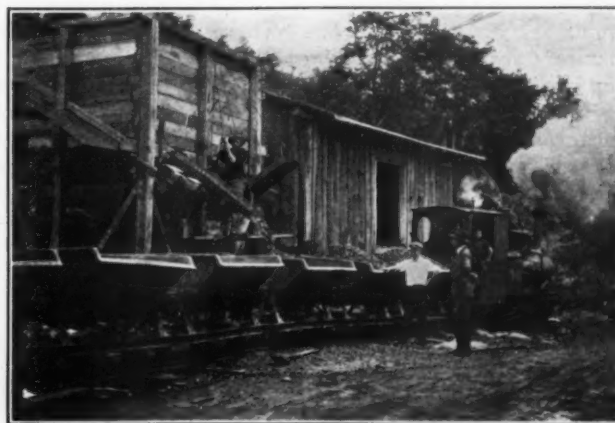
Stone was shipped in by rail by the Connecticut Trap Rock Company. No overhead trestle or dump was at hand, but at a point where the siding had an elevation 6 or 8 feet greater than the road, a home-made unloader was installed. This consisted of a wooden chute under the track, an elevator from a stone crusher and an elevated bin with a capacity of 10 cubic yards. The stone, dumped from the cars into the chute, was raised by the elevator, which was driven by a $7\frac{1}{2}$ -h. p. electric motor, into the bin, whence it could be loaded by gravity into industrial cars or motor trucks. With this outfit, a 40-ton car of stone could be unloaded in $1\frac{1}{2}$ hours.

Practically all the stone was hauled from this bin by industrial railway and the same cars were used at other times for shifting sand from place to place along the road, for grading, and for carrying sections of water pipe, which was taken up as the work progressed and moved forward. The industrial railway equipment used on this job consisted of about 12,000 feet of standard 24-inch gauge, 20-pound track, bolted to steel ties, sixteen $1\frac{1}{2}$ -yd. dump cars and two locomotives, one 20-h. p. and the other 30-h. p.

Two motor trucks—a Mack and a Garford—of 3-ton capacity are also used for hauling materials and supplies and have given excellent satisfaction. No figures as to cost are available, as part of the time the trucks have been employed on some of the other jobs being carried



LIFTING STONE INTO BIN.



LOADING CARS FROM BIN.

on by the same contractors. A Ford motor car, equipped with a 1½-yd. side-dump body from an industrial car, is used for general utility work.

Owing to the grades, which reach 6 per cent on the road and nearly 10 per cent on the spur from the road to the unloader, the industrial locomotives rarely handle more than 6 cars in one train; also the train length is practically limited to 6 cars because of the short loading track. Such a 6-car train can be loaded by a train crew of 2 men—the engineer and a helper—in about 10 minutes. As the unloader has a capacity of 26 tons per hour and the bin holds 10 tons, three 6-car trains can be loaded per hour, which is about the limit of the amount of stone that can be used. However, cement must be unloaded from the same track and at about the same place. This causes congestion at times and the contractors were planning to construct a loop around the railroad siding so that cars of stone or cement may be unloaded from both sides into the industrial trains.

The use of the industrial railway made possible a shortening of the hauling distance. From the unloader, the track is laid over a field a distance of about 500 feet to the road being constructed. In hauling by teams or motor truck, it would be necessary to follow a round-about road from the unloader, adding over a quarter of a mile to the haul.

With a gang of 27 men, a Koehring mixer lays about 300 feet of concrete road daily. The standard Connecticut highway specifications call for a 1:2:4 mix. Expansion joints made of two thicknesses of Neponset tar roofing paper are placed every 35 feet. Trussed Concrete Steel Co. forms are used. The road is finished by the belt method. Sterling barrows are used for handling stone and sand.

The 27 men in the mixer gang are employed as follows: 4 men wheeling stone, 8 men shoveling stone, 2 men wheeling sand, 4 men shoveling sand, 1 man putting in cement, 4 men placing concrete, 2 men on forms, 1 man finishing, 1 foreman, 1 engineer and 1 fireman.

Water is secured by pumping from brooks or lakes along the road. A steam pump forces the water through a 1½-inch wrought iron line laid along the road. In this line plugged tees are inserted in place of couplings at intervals of 75 or 100 feet. These plugs can be removed and a faucet and hose inserted when water is needed.

The contractors on the work are Mascetti and Holley, of Torrington, Conn. Jack Healy is engineer in charge of the work for the Connecticut Highway Department.

ELECTRIC SPRINKLING TRUCK IN HARTFORD.

Hartford, Conn., operates a sprinkling equipment consisting of a 5-ton truck, electric driven, carrying a 1,200-gallon tank and an electric motor-driven pump that pumps either water or oil. There are four flushing nozzles, two in front and one on either side, two sprinkling heads in front, and two lines of road oil distributing pipe at the rear. The driver controls the operation of each of these by means of levers. The entire equipment was purchased by the street commission from the Hartford Electric Light Company. For this information we are indebted to Leon F. Peck, superintendent of streets.

RELINING OLD FIRE HOSE.

In 1910 the Seattle, Wash., fire department purchased a large quantity of 3-inch and 3½-inch hose for use by fireboats. All could not be used, and, in consequence of lying in storage for several years, the rubber lining deteriorated to such an extent that it was useless,

though the outside of the hose was in good condition. The department shipped the hose to San Francisco, where an entire new inner lining was inserted, making the hose almost as good as new. The cost varied from 30 to 44 cents per foot.

OPERATING THE ST. LOUIS FILTERS

Adjusting and Testing Meters and Gauges—Determining Most Effective Operating Details of Filter Washing—Mixing and Applying Chemicals.

The large rapid filtration plant of St. Louis, Mo., at the Chain of Rocks, went into service in the spring of 1915. The construction has been described and referred to several times in Municipal Journal. In a paper before the Engineers Club of St. Louis, the operation of this plant and especially the trying out and tuning up of the filters was described by the engineer in charge of the Supply and Purifying section of the Water Department, C. M. Daily. Mr. Daily began his paper by a description of the plant, following which, he proceeded with a narration of the operation of the plant, which was as follows:

In commencing operation of the plant, each rate controller was adjusted and the filter unit put in service. The time required to put the entire plant in operation was about 30 days.

The adjustment and testing of the nine Venturi meters for the raw water, wash water and chemical solution, the orifice for measuring the chemical solution, and the recording pressure and elevation gauges received attention in the order given. In the meantime the operating force was instructed to wash at a low rate (18 inches vertical rise per minute), and to start the washing very slowly until all the air was expelled from the bed.

When all the machinery was in working condition, experiments were conducted as rapidly as possible to determine the best method to follow in operating the filters.

Tests for color and turbidity and determination of the bacterial content of the water were regularly conducted under the direction of the chemist, Mr. A. V. Graf, with the expectation that the results of these tests could be used daily for regulating the plant operation. It was soon evident that the time necessary for the incubation of bacteria brought these results too late to be of direct service, so that modification of the treatment had to depend upon the turbidity and color tests, leaving the bacterial results to follow later.

The following uncertain features in the operation were investigated without any preconceived ideas as to the final results: When a filter should be washed; the amount it should be drawn down before washing; the rate of commencing wash and final rate; the quantity of water to be used; the method of treating the filter bed after washing; the quantity of water that should be wasted after each wash; the rate the filter should be run and the time before raising the rate and the best rate of filtration.

When the plant was first put in operation the aluminum sulphate solution lines, which were constructed of 8-inch tiles and 4-inch fiber pipes, failed to stand the slightest pressure, and dry aluminum sulphate was added to the water in the influent flume, starting the latter part of May, 1915, and it was not until July 7th that it was added to the water in the coagulation basins. This necessarily caused slightly turbid effluent water except when a good film of mud and aluminum hydroxide was formed on the sand, which incidentally made the tur-

bidity tests in the filter operation of more importance than they otherwise would have been.

Turbidity tests of the effluent water were taken every ten minutes from the time a filter was put in operation until the rate of filtration fell off, due to clogging of the sand. On several filters operating at different rates, the results were erratic in regard to the amount of turbidity but were uniform in the following respects: The first filtrate amounting to about 5,000 gallons was clear. Following this was a quantity, varying greatly and sometimes exceeding 18,000 gallons of turbid water, followed by a clear effluent until the loss of rate fell off due to clogging of the filters. It was also observed that the same filter running at a low rate allowed a smaller quantity of turbid water to pass than when running at a higher rate. Filters having coarse sand allowed more turbid water to pass than ones having a layer of fine sand on top, the effective size being a poor indicator of the probable results. These results raised the question of at how low a rate a filter should be run to produce the minimum quantity of turbid water, and how long it should operate at this rate. Tests were made on several filters varying from 5 m.g. per day to $\frac{1}{2}$ m.g. per day, those being the maximum and minimum quantities which could be automatically controlled. These results, as before, were erratic as to the amount of turbidity but uniform in two respects: First, the lower the rate, the smaller the quantity of turbid water passed; second, after a period of from 40 to 60 minutes running at a $\frac{1}{2}$ m.g. rate, the rate could be raised to any quantity which could be controlled without increasing the turbidity. In this series of tests it was observed that after washing, when a large amount of aluminum sulphate was added to the water as it entered the bed, a smaller quantity of turbid water was delivered by the filter. The turbid water left in the filter below the wash water gutters after washing seemed to produce a much larger floc when mixed with the influent while filling the filter, which led to another series of tests to determine, if possible, a method for treating this remaining water to reduce the quantity of turbid water delivered directly after washing.

Various quantities of dry aluminum sulphate were added to the water in the central gutter while filling the bed after washing. The filter was put in operation after being allowed to stand for a length of time varying from a few seconds to an hour, and at the same time varying the rate of filtration. The results clearly showed that the quantity of aluminum sulphate required to produce a heavy floc, about 14 pounds, and filtering at $\frac{1}{2}$ m.g. rate for 40 to 50 minutes gave the best results, reducing the amount of turbidity often $\frac{1}{4}$ part per million and never exceeding two parts. No advantage was obtained by leaving the bed standing for any length of time after filling.

At first, when a filter needed washing the influent was shut off and the bed allowed to operate until the water fell below the top of the wash water gutter, when the washing was started and the quantity of water above the sand was wasted with the wash water. Numerous tests were made by allowing the filter to run, after the influent water was shut off, until the bed was drained. The results were uniform, showing a good effluent until the water level was far below the top of the sand, but the imprisoned air in the sand usually broke the film, cracks appearing along the walls and a contraction of the film seemed to cause checks as the water reached a point a few inches above the sand. Undoubtedly a poor effluent would be produced by the water passing through the broken film, but all the water in the underdrain system and gravel must pass before this water could

reach the effluent flume, so there was no danger in drawing the water down to within an inch or two of the sand. If the water is drawn below the sand, packing occurs and the bed does not break up properly when washing, hence nothing is gained by drawing the water below the film of the sand.

The amount of filtrate necessary to be wasted after washing was studied and conclusions reached that it was unnecessary to waste any water with the adopted method of low rate filtration for one hour and treating each bed after washing.

As to the amount of wash water required and the best rate of washing, some uncertainties still exist, and probably will continue, as the kind of material carried in suspension, the time between washings, and the quantity of aluminum hydroxide on the sand greatly influence the quantity of wash water necessary at any rate of washing. At first a low rate of wash was used, about 18 inches vertical rise per minute; this was continued for about six months, resulting in the formation of mud balls varying in size from $\frac{1}{8}$ inch in diameter to $1\frac{1}{2}$ inches in diameter, most of them being of the smaller size; the rate was then raised to 21 inches and finally 24 inches per minute vertical rise, at which rate some of the smaller particles of sand would rise nearly to the wash water gutters. The high rate seemed to prevent the increase of the mud balls but did not eliminate the ones already formed. Screens having $\frac{1}{4}$ inch mesh mounted on wooden frames were drawn through the sand while washing; usually after screening the sand in this manner from five to ten times, most of the mud balls were removed, but unless there was a very even distribution of wash water, spots or hard lumps in the sand would occur.

On one filter bed (No. 34), it was found that the north side washed at a much higher rate than the south side. The north side was cut off with blank flanges and on washing the south side alone it was found that the greatest amount of wash water possible to get through this side was 9,600 gallons per minute, or 22 inches vertical rise per minute with the maximum head of 35 feet on the strainer system. All the sand and gravel was removed in sections and many of the holes in the strainer plates were found to be plugged with cement and sand grains. The holes were cleared by hand at a cost of \$150, and when put in service, the cleaned side washed at a slightly greater rate than the other side.

It was very difficult to determine a slight difference in the rate of washing of the two sides, and in order to have some means of determining this a device was constructed for collecting samples of sand simultaneously at various distances below the wash water gutters while washing. This sand collector consisted of 15 telescopic cans 3 inches in diameter and 3 inches high provided with $\frac{1}{4} \times \frac{3}{4}$ inch openings near the top, covered with rubber slip valves, each can having an air vent projecting above the water when submerged. The cans were mounted on a suitable wooden frame and lowered into the sand while washing, the slip valves removed, thus obtaining samples of sand at various depths. From these samples the distance from the top of the wash water gutters to the sand while washing was determined within 3 inches, and the location of mud balls as well as the grading of the sand was shown.

Observing the action of the sand in clear water while washing, it is interesting to see how smooth the sand bed becomes, how scarcely any action can be seen, no scrubbing or boiling, merely isolated sand grains suspended in a steady upward current of water. In contrast with this, the boiling action of an air wash must

at least possess a scouring action not possible to obtain with the modern high-rate-of-wash filters.

The washing of a filter seems to be largely a matter of judgment, the rate being governed by the height to which the sand grains rise, but this should not be high enough to allow sand to overflow into the gutters. The higher rates seem to produce the best results with a minimum quantity of water.

In beginning a wash, if the rate is high, violent explosive actions occur in the bed, due to imprisoned air, which in some cases tear large holes in the sand, rolling the film of mud together, producing mud balls and leaving portions of the bed unbroken. This condition was avoided by first starting the wash at a very low rate, about 3 inches vertical rise per minute, and continuing until all the air is expelled. This method also avoids destructive ram action on the strainer system.

Measurements of the quantity of imprisoned air in a filter bed are now under way; from eight observations made from June 1st to 10th, 1917, the average quantity is approximately 380 cu. ft. of free air.

Samples of sand through a vertical section of several beds were collected by driving two 1¼ inch angle irons through the sand to the gravel after draining the bed, so as to inclose a pyramidal section which could be withdrawn and trimmed to a uniform section. These sections were divided into several equal lengths and washed clean in a definite quantity of water, the turbidity of which was proportionate to the quantity of sediment in any vertical section of the bed. It was found that most of the sediment was in and above the top ¼ inch layer of sand and below 6 inches from the top, the amount of sediment in the sand remaining nearly constant during the whole period of filtration and washing.

Some difficulty was experienced by the operators at first in judging the rate at which a filter was being washed. Opening the wash water valve a certain amount did not always give the same quantity each time, due to difference in elevation of the water in the wash water tanks, and also to the frictional resistance in the bed. This led to the installation of a low friction rotary switch which was operated by the rocker arm of the recording switch of the wash water Venturi meter. This switch controlled a current to three electric lights mounted at the south end of the plant, allowing one lamp, a green one, to light when the rate of wash was between 5,000 and 17,000 g.p.m. and a white lamp to light when the rate was between 16,000 and 20,000 g.p.m. and a red lamp to light when the rate was above 20,000 g.p.m. These lamps can be seen from any operating table in the plant and allows the operator to wash any filter with a variation of not over 5 per cent in the rate of wash. This device has proven very satisfactory and no inaccuracies of the Venturi meter have resulted from it.

The aluminum sulphate used in connection with filtration is bought in bulk, the lump usually being under 2 inches in the greatest dimension; it is shoveled from the cars into an elevator boot where it is elevated to the top floor of the head house, and by means of cross conveyors is dumped into any one of the six hopper bins. It is taken from the bins below through vertical chutes emptying into steel weighing buckets running on a trolley. A definite weight is dumped from these buckets into a concrete dissolving box, where it is dissolved by a stream of water passing through it into storage tanks below. After dissolving the contents of one dissolving box, the tank underneath is filled with water to make a definite percentage solution of the chemical. From these tanks the solution is pumped to orifice boxes at both ends of the filter plant. In these orifice boxes the level

of the solution is maintained at a constant head by pumping a greater quantity than that used, the overflow returning to the storage tanks. The opening of the orifice is varied in size by means of a nearly conical plug. This plug on three of the orifices at the north end is operated by motors controlled by floats in tubes connected to the two 8-foot Venturi meters through which the water to be filtered passes, so any ratio of solution to the water to be filtered is maintained automatically through a wide variation in the amount of water passing the 8-foot meters. The solution from the orifice passes through 4-inch Venturi meters, which record the rate of flow, and is discharged into the water before entering the mixing basin north of the filter plant.

The solution from the hand controlled orifice boxes is discharged into the influent flume after passing through recording Venturi meters.

The chlorine is, at present, purchased in steel cylinders containing about 100 pounds of liquid chlorine. The chlorine is measured by four indicating rate-of-flow machines and goes into solution in rubber towers filled with pumice stone by allowing water to trickle down through the tower, the gas discharging into the bottom of the tower. The corrosive action of the gas when moist is very great and a lot of time and care is required to maintain in proper condition those metal parts of the machine which come in contact with the gas. Chlorinated oil from the gas requires the rate-of-flow machines to be cleaned about once a week.

The filter plant is heated by three 150 hp. boilers located in the head house. The system used is Webster's vacuum system. There are about 3,200 square feet of cast iron radiators and an average temperature of 68° was maintained in the plant when the outside temperature was 6° below zero.

The average costs for labor, material and general maintenance for the period between June 1, 1915, and April 1, 1916, and the succeeding twelve months are \$2.47 and \$2.05, respectively, per million gallons. This cost does not include the lime and iron used in softening and coagulation, but does include the aluminum sulphate and chlorine.

During the year ending April 1, 1916, 1.84 grains of sulphate of iron and 5.57 grains of lime were used per gallon of water pumped into the basins; during the year ending April 1, 1917, 0.72 grains of sulphate of iron and 5.23 grains of lime per gallon were used, making a total cost of purifying the water before adding the aluminum sulphate at the filter plant, for the year ending April 1, 1916, \$4.37 and for the year ending April 1, 1917, \$3.54 per million gallons.

OPERATION OF STREET FLUSHER IN VICKSBURG.

The following figures concerning the operating of a motor street flusher in Vicksburg, Miss., are given by A. M. Paxton, city clerk, and apply to the year 1916. The flusher was Etnyre's high-power flusher, mounted on a 3½-ton Federal truck.

During the twelve months, this machine flushed 20,097 blocks (length of block not given), the number per month varying from a maximum of 1,999 in November to a minimum of 804 in March. The water used totaled 10,160,200 gallons. Of gasoline, 3,151 gallons were used, the cost varying from 20 to 23 cents. Oil cost from 45 to 62 cents per gallon, and 78 gallons were used. The total cost per month, including grease and accessories, varied from \$31.66 in March to \$75.09 in May, the total for the year being \$732.02, or about 3.6 cents per block for gasoline, oil, grease and accessories.

AIR DRILLS FOR REMOVING PAVEMENT SURFACES

Use by Four Cities for Making Cuts in Bituminous and Concrete Pavements—Different Tools Used and Some Cost Figures.

By use of a portable rig equipped with compressed air drills the Public Works Department of Portland, Oregon has effected a material saving in the cost of cutting pavements for repairs and for water main and sewer construction. The machine is owned by the Northwestern Electric Company of Portland and is used by them for all pavement cutting work. It is rented by the city for its work.

The machine is a portable rig equipped with a 15-H.P. gasoline engine, driving a 9 by 11 Chicago pneumatic air compressor. The compressor operates two 50-pound air hammers, requiring 40 cubic feet of air per minute at 110 pounds pressure. In ordinary practice about 80 pounds pressure is used on these hammers, but in cutting pavement, especially pavement with a concrete base, the higher pressure greatly increases the output of work. It has been found, however, that an increase over 110 pounds pressure causes the breakage of drills to become so high as to effect no additional economy.

The rig used in Portland is much heavier than is required to operate two 50-pound hammers, but it was constructed by the electric company from apparatus on hand; consequently, any economy along these lines was not made a consideration.

The cost of operation is virtually the same for the city as for the company, depending to a great extent on the cost of labor. The company's cost for cutting asphalt pavement is: With the air hammers, 7 cents per square foot; by hand, 15 cents per square foot. The company's cost for cutting bitulithic pavement is: With the air hammers, 5½ cents per square foot; by hand, 12 cents per square foot. This pavement is removed in slabs

about 4 feet by 4½ feet by the method described further on. These figures are based on normal labor conditions. The present increasing cost of labor will increase them slightly.

In Des Moines, Iowa, removing concrete pavement to lay underground conduits for electric service lines by methods in use prior to the application of the jack-hammer drill would have necessitated removing whole panels, but with these drills it was possible to restrict the cutting to a strip about a foot wide. Based on the use of two drills and an electric portable compressor, the engineer's estimate was 30 cents per foot, which in working was reduced to an actual cost of 18 cents. Hand work would cost about 40 cents per foot.

Drills of the same type have been used in large numbers for taking up old concrete in New York City subway building. It is common practice, in this work, to substitute a pointed chisel for the usual rock-cutting bit. The chisel is very effective where concrete is 3 or 4 inches thick, as it permits the wedging and breaking off of relatively large lumps. Other air tools also have been adapted to cutting out concrete pavements. In some instances a large pneumatic riveting hammer fitted with a suitable chisel has been found an excellent pneumatic pick. In other cases the pneumatic tie tamper fitted with a sharpened pick has been found convenient.

For taking up asphalt paving the tie tamper fitted with a chisel about 3 inches wide is used. First the tool is used for making a cut which marks the slabs to be removed. Then the tool is held upright, as in Fig. 2, and the pavement is cut through and pried up. At Elmira, N. Y., four men removed approximately 600 square feet per hour, at a fraction of the cost of hand work.

Another tool also used for the same work is a smaller hand pick. With this tool, narrow grooves are cut, marking the portion of the asphalt to be removed, at an average rate of 20 lineal feet per hour. (See Fig. 3.)

Bitulithic pavement, being softer and of a somewhat sticky nature, is removed in a slightly different manner. A chisel some 1½ or 2 inches wide is employed to make a series of cuts, each the width of the chisel and spaced about 2 inches apart. Cuts of just sufficient depth to



FIG. 1.—BREAKING CONCRETE WITH HEAVY AIR HAMMER.



FIG. 2.—CUTTING ASPHALT WITH TIE TAMPER.

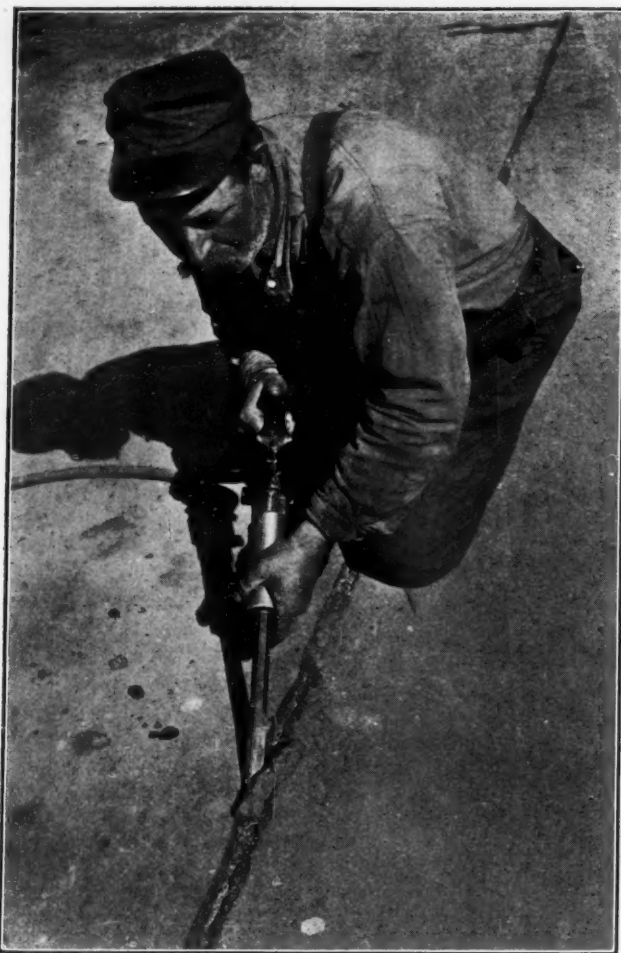


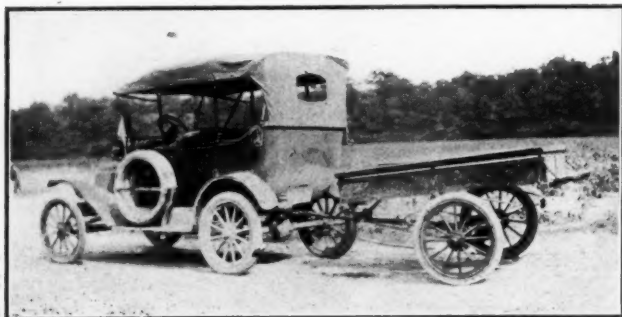
FIG 3.—CUTTING ASPHALT WITH PNEUMATIC PICK.

mark a distinct cleavage line are made on one side and the ends; the pavement is cut through on the remaining side, a crowbar is slipped under and the block or slab of pavement pried out.

A slight break in a bituminous surfaced macadam road quickly develops under heavy traffic into a deep rut, and the pneumatic pick has been used to loosen up the road-bed as soon as a weak spot develops, additional crushed stone being placed and the spot compacted by a pneumatic tamper.

UTILITY CAR AND TRAILER.

The outfit illustrated herewith is used by E. C. Humphrey, Inc., contractors of Hackensack, N. J. The trailer is made from the rear wheels of an otherwise worn-out Ford, equipped with springs and a light body. The outfit can carry 4 men—or more in a pinch—and several hundred pounds of materials or supplies rapidly over any passable road. For getting men and supplies



A HOME-MADE TRAILER.

to a point in short time or for rapid transportation of articles of small bulk it is a valuable adjunct to the contractor's transportation equipment. The cost of operation and maintenance is low and the trailer can be uncoupled at any time.

ROAD WORK WITH CONVICTS IN IOWA

Conclusions from Three Years' Experience—Methods and Appliances Used—Cost Figures—Where Convicts are Used Advantageously.

During the past three years the Iowa Highway Commission has been using prisoners for road work at the various state institutions. During the first two years, in beginning the work, it was not expected that the same efficiency would result as would be possible after an organization was perfected and experience had shown the profitable ways in which prison labor could be used. The commission considers that the results of the 1916 work make a very good showing for convict labor.

In constructing a road at the State Hospital at Cherokee, work was started on an excavation which had been opened by a steam shovel and the work of trimming and shaping the banks made the cost run as high as 32c a yard; later this cost was reduced to 22c. The material was very hard and necessitated extra teams for ploughing. The men loaded the earth into Koppel cars by shovels, some days handling as high as twenty yards per man. On work of similar character at the Iowa State College farm, where a deep cut was necessary to reduce the grade of the road, Koppel cars were also used successfully. These were loaded by shovel and formed into trains of four to six cars, which were allowed to coast down the grade to the point where earth was needed for a fill. This same gang also constructed a reinforced concrete viaduct at a total cost of \$7,375.37, of which \$1,134.22 was chargeable to the convict labor. With the exception of one carpenter, the superintendent-in-charge and teams used in hauling, the convicts did all the work.

The men in this gang were not skilled workmen, but were willing to work hard and were apparently anxious to make good on their work. They turned out a quantity of work far beyond the expectations of the commission. It is doubtful if it is possible to get together an equal number of free laborers who would perform the same amount of work.

The cost of road work let by contract at Woodward was 21c per cu. yd., at the Iowa State College 25c, at Rockwell City 25c and at Council Bluffs 24c. The cost of earthwork using prison labor at Cherokee was 28c. It should be noted also in this connection that the crew used at Cherokee did more work than could be expected from the average prison labor. The cost of earthwork at this place during 1915 with a different crew was about 38c per cubic yard. The average cost at Iowa State College in 1915 on part contract and part prison labor for road work was 30.1c. The cost of tiling by prison labor at Woodward was 11c per foot and at Rockwell City by contract 7.8c per foot. On the same depth of cut, the costs would have been almost exactly equal.

The cost of concrete used for encasing tile, placed by prison labor at Woodward, was \$14.69 per cubic yard; concrete in box culvert work cost \$10.80, and in bridge extension work, \$11.70. The cost of the concrete work by contract at Council Bluffs was \$15.

From these comparisons it will be noted that on road work on which teams and earth moving machinery can be used, convict labor cannot compete with contract prices. It would not be practicable to attempt to outfit

crews of prisoners with teams and machinery for this character of work. The only places where convict labor can be used with economy on earthwork would be where there are large yardages of dirt to be moved within narrow limits, where industrial railway equipment can be used to advantage. In such instances, the cost of convict work can be kept near the cost of contract work if picked crews are used. It is possible to use convicts in laying tile for road drainage or other purposes that require hand labor without special equipment.

The Iowa Commission believes that the only place where prison labor can be used profitably is in the preparation of road materials or in the loading of such materials for distribution to counties. An exception to this is the employment of prisoners to perform the necessary work at various institutions where labor is not available from the inmates and in some county work. The permanent road work of the state can be done better and more economically by contract.

While the best service for which prison labor can be used in road improvement is in the preparation of materials, such as furnishing stone or gravel from quarries or pits, the ultimate object of the employment of convict labor is the development of the prisoner himself. The men who have constituted the road camp and who have come under the observation of the commission have benefited physically and mentally. These men have been paid at a rate varying from 20c to 25c per hour, the rate for 1916 being 22½c. Many of these have saved some money and have been able to assist those dependent upon them. The state has benefited from the employment of these men as their entire living cost, including the expenses of guards and transportation, have been paid from their earnings.

The state of Iowa does not have road building of the character that has been quite successfully handled by some states with convict labor, where a large amount of manual labor was necessarily employed, nor does it have the same character of prisoners as do some of the southern states. These differences must be recognized in the methods adopted to utilize such labor.

FAULTY CONSTRUCTION OF WOOD BLOCK PAVEMENT.

A recent inspection of Chapin parkway in Buffalo, N. Y., showed neglect of a precaution in construction which has caused much trouble in maintenance of the street surface, and replacing of the blocks in the same manner is giving opportunity for a return, at least in part, of the same difficulty. The drainage of the surface of the pavement base seems to have been faulty, so that water reaching it did not drain off rapidly. The blocks were laid on a sand cushion of perhaps 1½ inches depth and the lugs on sides and ends of blocks made the sand-filled joints about ⅜ inch wide, so that traffic passing over the pavement when the cushion was saturated with water was able to churn up the sand and displace it so that it was collected under some blocks and removed from beneath and between others, thus making the surface of the street very uneven.

Some months ago Geo. W. Tillson inspected the pavement and recommended that it be relaid on a mortar bed with water tight joint filler, but the repair seems to have been made by relaying the blocks in the same manner, a considerable portion of the driveway in difficulty having been so replaced. There seems to have been no trouble with expansion of the blocks by absorption of moisture or otherwise, indicating full waterproofing of

the blocks by the treatment to which they were subjected. Indeed, the blocks either have shrunk or were originally laid only loosely, as the joints are now equal in width to the lug depths or even more.

Similar trouble to that at first complained of has begun to develop again and one area of a very few square yards shows considerable lateral displacement of blocks and some vertical displacement by the washing or churning of sand out of the joints and out from under blocks. At several other places ridges and bulges are developing which are very evidently not due to expansion of blocks, the joints being wide and seemingly loosely filled with sand, but are rather due to displacements of the material on which the blocks rest.

RIVER CHANNEL IMPROVEMENT AT COLUMBUS

Work Planned to Prevent Recurrence of Damage Done by Flood of 1909—First Contract Now Under Way—General Plan Outlined.

The flood of 1913, which did so much damage at Columbus, Ohio, and other cities of the central west, occurred nearly four and a half years ago, and the beginning of the work of improving the channels of the Scioto and Olentangy rivers to reduce the danger of future flood damages was made on July 30 of this year, with the signing of bonds for the work, for which \$3,500,000 of bonds are to be issued. Immediately after mayor Karb and auditor Ginder had signed the first bond, the first shovel of dirt on the actual construction was turned and the event celebrated by parades of city officials and citizens of the west side, who have labored hard to bring



PLAN OF PART OF COLUMBUS, OHIO, SHOWING PROPOSED IMPROVEMENTS OF SCIOTO RIVER.

Double lines indicate levees 80 ft. wide on top. Heavy lines, retaining walls. Hatching, paving on levee slope. B, Town street bridge, to be built by bond issue. L, Rich street bridge, to be lengthened by bond issue. C, C, bridges to be lengthened or built by county. R, R, bridges to be lengthened by railroad companies.

about this improvement in a form which will give as great insurance against future flood damage as they felt themselves able to afford, even with material aid from the city at large. Part in the ceremonies was taken by director of public service Borden, councilman Westlake, city attorney Scarlett, city engineer Maetzel, county commissioner Sinclair and the mayor and city auditor.

The contract which begins this work is one for the extension of Rich street bridge to make it conform with the enlarged waterway. The work consists of adding two spans to the west end of the bridge and involves excavating 3,170 cu. yds. of earth above low water at \$1.65; 2,280 cu. yds. below low water at \$4.25; concrete footings for piers and abutment, 730 cu. yds. at \$8; and 2,320 cu. yds. of concrete above the footings at \$8.70. The old west abutment will be turned into a pier with stone facing on all sides, there being 215 cu. yds. of stone work at \$10; 3,360 lin. ft. of wood piles under the piers and abutments and 2 M ft. of wood sheet piling at \$120, complete the more important items of the contract.

For girders for the two spans there will be used an old bridge a short distance down stream, which will be taken down and re-erected for a lump sum of \$11,320. A new steel floor, lateral bracing, sidewalk brackets, etc., will require about 227,800 pounds of steel at 8.8c., and 800 lin. ft. of hand rail will be set at \$5.50 a foot. The floor will be of creosoted timber, there being 800 sq. yds. at \$2.60 a yd., and 45 M of timber at \$80. The contract totals about \$90,000 and was awarded to the Capitol Construction Co. This bridge is marked L on the accompanying map.

The next contract to be let in connection with the channel improvement probably will be for a new seven-span reinforced concrete arch bridge at Town street (marked B on the map), plans for which will be ready about October 1. Several other bridges within the limits of the channel improvement will be built by Franklin county, and their cost is not included in the three and one-half million bond issue. One of these bridges, plans for which have been prepared by Fleming & Knollman, as engineers, will probably be contracted for late in August.

Detailed plans for other parts of the work have not yet been completed, but the general plans (subject to some changes as the details are developed) may be described as follows:

By common consent the minimum width of the new channel in the Scioto river through the center of the city has been fixed at 580 ft. With the available height of levee, this width will not carry the estimated maximum flood flow, although it will very nearly carry what was estimated to have been the flow of the 1913 flood. The plans provide for a relief overflow located as described below, which will reduce to a minimum in area and amount the damage due to this possible but not probable excess of flood over capacity of channel. It is believed that the chances of damage by this plan are small enough to warrant the great reduction in cost secured by a 10 per cent reduction in capacity. It is estimated that the bond issue will pay for the land to be purchased, the bridges to be lengthened and rebuilt (not including those to be constructed by the county), the retaining walls, levees, boulevards on part of the levees, bank and levee protection, the dam at Starling street, and all work connected therewith. This allows for excavating, within the width of the channel, sufficient earth to build the levees, but possibly not to remove all the earth required to bring the bottom of the new channel, outside the present low-water channel of the river, to a level slightly above low-water. Such excavation is necessary, however, in order that the new channel may have as much capacity as possible and still provide for concentrating the low-

water flow to at least as small a channel as carries it at the present.

The water in the river is now deepened in front of the city during low-water by means of a dam near Starling street, the object being to prevent the creation of unsanitary conditions by sewer overflows and other drainage channels, the flow from which might produce nuisance if spread out in a thin sheet over an exposed channel bottom. The flood-water channel bottom is designed with a profile to prevent this except for the brief period when a moderate flood first rises out of the low-water channel, or is just falling back into it. A new concrete dam will be built to take the place of the old wooden dam, about 18 ft. high above the base, some 6 ft. of the lower part being below the bed of the stream. Flash boards can be put on this dam to regulate the time that the water will lie on the bed of the flood channel outside of the low-water channel, or for any other purpose. A study of the effect of this dam on the elevation of flood water shows that it raises it less than 1 ft. at any point above it.

According to present plans, the 580 ft. width of channel will extend about one-quarter mile south of the Mound street bridge. Below this point the present channel is quite wide, and levees will be built along it, probably using material excavated from the channel above. No improvement has been planned for the present beyond Schiller street and the Hocking Valley railroad, pending the settlement of some questions of plans for other affected work. Wherever not mentioned as otherwise protected, the river above this point will be provided with levees, these in some cases being 80 ft. wide on top so as to give room for a boulevard, in other places the width being about 16 ft. On the east side of the river there will be a boulevard from Schiller street to Mound street; and on the west side from Rich street to Broad street.

Along some stretches retaining walls will be required, generally because the levee would encroach upon buildings or valuable area. The retaining wall on the west side will probably be left about 2 ft. below the working level of the levees so that it can serve as a relief overflow to prevent the flow overtopping the levees. In the preliminary plans this wall is of reinforced concrete set on piles, with a base 21 ft. wide and 2½ ft. thick, set 4 ft. below water level and carrying a retaining wall 24 ft. high, 7 ft. wide on the base and 2 ft. wide under the coping. The present surface of the ground is about 9 ft. below the top of this wall, and any water flowing over the wall would find its way over the streets and southward through the city behind the levee; but the amount of water so flowing would be but a very small per cent of that which did so much damage in the 1913 flood.

On curves and wherever else it may be necessary, the slope of the levee will be protected, probably by concrete slabs or stone paving. Where the latter is used, the stones will be set beginning at the top of the levee slope and will slant back so that, if the lower stones are displaced, those above will not fall down the slope.

The railroad bridges will be lengthened or reconstructed by the several companies at their own expense, and, as stated before, the county will lengthen the county bridges across the river.

The estimate on which the \$3,500,000 bond issues was based included \$1,750,000 as probable cost of land to be purchased; but the board of appraisers has fixed the value of this at about \$750,000, and it seems probable that the cost of proceedings and all other expenses will not increase cost of the land beyond \$1,000,000. It is hoped therefore that the entire work can be completed within the estimate, although the present high prices for materials and labor may continue for some years and affect the cost unfavorably.

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W. A. HARDENBERGH and SIMON BARR, Assistant Editors
CHARLES CARROLL BROWN, Western Editorial Representative

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INJUSTICE TO PAVING MATERIALS.

A brief article in this issue refers to a piece of wood block pavement which is getting into bad shape through no fault of the blocks, but which will probably lead many who are not well informed on the subject to condemn all wood block pavements. In this case the trouble has apparently been due to the use of a too thick sand bed as a cushion and sand as a joint filler, which fail to provide firm support for the block.

Recently in New York we saw a patch of wood block pavement that was rapidly becoming a mere lot of loose chips, which were being scattered over a considerable area. The pavement surrounding this patch is in good condition, but the average citizen, looking at the pavement, would probably have his attention held by the bad hole that is rapidly forming, and condemn all wood block. There is of course only one explanation of this condition—in repaving over a cut the blocks were laid with their fibers horizontal instead of vertical. The result is the fault not of the wood blocks but rather of the wooden head of the man who relaid them.

Wood blocks have happened to be involved in both of these instances, but the same conditions can be found in connection with other paving materials. Concrete pavements, for instance, are more largely dependent for success upon the work of mixing and laying than upon the quality of the cement used, and a poor concrete pavement should not cause condemnation of either the cement used or such pavements in general. The same is true of asphalt. Brick and stone block are somewhat more fool-proof. But we doubt whether there is any kind of pavement laid of which some faulty samples cannot be found, and no one should

condemn any of them on such evidence alone unless expert analysis has revealed the cause of the defect to lie in the material. A good pavement, showing what can be done with a material, is more convincing evidence than a poor one that merely shows what improper use can do with it.

HEALTH DEPARTMENT LABORATORIES.

The establishment of a laboratory in a health department is undoubtedly a mark of progress. Its service in diagnosing cases of infectious diseases cannot well be given by any other department. The good will of the physicians of the city depends to a large extent on the efficiency of the department laboratory—and in these days of increasing resentment of the practitioner against the growing municipalization of public health activities, this good will must be fostered with greater care. The department laboratory must give good service or else the physicians will feel justified in opposing extensions of the city's work as political rather than necessary.

The mere existence of a bacteriological laboratory is not sufficient, and recent incidents draw attention not only to its uselessness but even to positive danger unless the laboratory is properly managed. According to an item in this week's issue of Municipal Journal the work of a substitute bacteriologist in a New England city recently created a false alarm of a diphtheria epidemic. He was turning in positive reports on three-quarters of his specimens when the regular bacteriologist, working in alternate periods, was reporting normal conditions. Then there is the story of the bacteriologist in the department of a large city who developed an amiable optimism regarding the presence of diphtheria in the city. When an epidemic of the disease swept the city it was discovered that his routine diagnosis consisted of throwing all specimens into the waste basket. Only a few months ago a board of health had to pay the expenses of a patient to whom diphtheria anti-toxin had been administered following a mix-up in reporting a diagnosis.

There is an urgent need of better supervision of health department laboratories. There must be a more accurate routine and provisions for adequate checking and proper reporting. Competent chemists and bacteriologists must be employed and a careful control exercised over all assistants. The requirements of modern epidemiology must be met or the health board cannot justify its existence. The diagnostic laboratory is vital in fighting disease. It is the first line of defense against an epidemic. It should be even more than this—it should act as the outermost patrol—the scout service.

PUBLIC INTEREST IN PURIFICATION PLANTS.

Water works engineers and officials throughout the country are not the only ones interested in the large rapid filtration plant at St. Louis, but the citizens of that city take considerable interest in it, many thousands of them visiting the plant and the park surrounding it during the spring, summer and fall of 1916. Believing that confidence in the plant would be increased by a more intelligent knowledge concerning the purification process, the department stationed a guide there whose duty it was to explain the operation of the plant to the visitors. One of the points which excited the greatest interest was the addition of the chemicals to the water and the mixing of the two which takes place in the mixing conduits. In order to encourage this popular interest and give a better opportunity for watching this process, the officials removed the iron floor plates that covered the conduits at the points where this action takes place, protecting the openings by erecting an ornamental iron railing around them.

The WEEK'S NEWS

State Highway Events in Massachusetts and Michigan—State Health Work Reorganized in Maine—Newport's Diphtheria Epidemic—Springfield, Ill., Waterworks—The Kansas Natural Gas Fight Decision—Fighting Utility Poles in Brooklyn—Firemen and Police Win Strikes for Higher Pay—St. Louis to Vote on \$18,000,000 Improvements—Economy Fires Employees in Springfield, Ill., Oakland, Cal., and Portland, Ore.—Connecticut's New Billboard Law—Capitol Improvements in Harrisburg.

ROADS AND PAVEMENTS

Road Builders Protest Against Freight Service.

Washington, D. C.—At a meeting of road building men held at the Automobile Club of America, a resolution was adopted providing for a committee to take action looking to carrying into effect other resolutions then adopted and specially that part thereof referring to the shipment of road materials. The chairman was given power to name the committee and to add thereto. After several attempts to arrange for a conference between the committee and the commission on car service of the railroads' organization for the war, such committee members as could be assembled, with Col. E. A. Stevens as acting chairman, met the commission at Washington. There were present on behalf of the committee, Messrs. Geo. P. Coleman of Virginia, H. G. Shirley of Maryland, M. B. Greenough of Ohio, E. L. Powers of New York and Col. E. A. Stevens of New Jersey. It was at once apparent that there was no desire on the part of the car service commission to place any embargo on road materials, but rather a willingness to expedite shipments as far as possible. After a full discussion it was the unanimous conclusion that this end could best be reached by furnishing the commission with such evidence as will aid the latter body in securing a maximum efficiency in the use of cars, each case of delay being dealt with on its own merits. In order to give this aid it is necessary that the commission be informed of cases where cars now returned empty could be used, of the dates, places and car numbers and initials of delayed shipments, of the causes of delay and of any remedies suggested to secure improved service. Any early increase in efficiency of transport of road materials can be attained only by a more efficient use of the present equipment and not by any addition to the number of cars. The committee believes that accurate and detailed reports of instances of failure to utilize present equipment to the best effect will be of material help to the commission on car service and will be welcomed by it. The committee would, however, deprecate complaints unaccompanied by such facts and suggestions as will be of help in meeting the difficulties of the situation.

Massachusetts Takes All Financial Risks in Contracts.

Boston, Mass.—The state highway commission is carrying on some of the road work under its charge by new forms of contracts, designed to shift to the state the burden of extensive charges for labor and materials and the responsibility for delivering materials when needed. Under existing conditions no contractor can afford to bid on extensive road work except at a price high enough to save him from loss in case labor and materials increase greatly in price. Under ordinary conditions an experienced contractor can foresee changes in such prices and allow for them, but he cannot do so at present and consequently his bids on work are very high. It is not believed that these high prices on materials and labor will continue, and the new form of contract used in Massachusetts will enable the state to save considerable money when both labor and materials can be procured at a lower rate than the contractor now believes it safe to figure on. Last May the state made a contract with an experienced highway contractor under which it agreed to furnish all the machinery and materials and the contractor agreed to furnish all labor, teams and small tools. The books of the contractor are kept in detail and are open to the examination of the state highway commission at all

times. The commission pays the contractor for his labor expenditures every week or every fortnight, and it also pays for workmen's insurance. Maximum limits have been set for the pay of labor, but these can be increased by mutual agreement should necessity for doing so arise. The other expenditures of the contractor are paid back to him monthly by the commission. The contractor receives for his overhead expenses, personal services, the use of small tools and for his profit, an agreed upon sum for each unit of work performed, these prices being made out on the basis of so many cents per cubic yard for gravel surfacing, so many cents per ton for local broken stone in place and rolled, so many cents per foot for pipe, and the like. Another form of contract that is used has been adopted when all bids for a job were considered too high. In such a case an arrangement has been made with the low bidder to do the work at actual cost plus an amount for profit and overhead expenses figured on the unit of each class of work, as 7½ cents per cubic yard for excavation. Under this contract the contractor supplies labor, tools and machinery and pays his liability insurance, while the highway commission furnishes the materials, and pays the contractor his actual expenses. If the actual cost of the work proves less than the original bid, the contractor shares the saving equally with the highway commission, but the contractor in no case is to receive more than his bid. Under this form of contract the state is assured that the work will not cost more than a specified sum and if the expense of construction is less than the contractor estimated, the state will obtain the road at a lower price than the original bid.

Detroit May Do Own Paving.

Detroit, Mich.—Detroit will be enabled greatly to facilitate paving construction under a forgotten clause of the municipal charter found by corporation counsel Dingeman. The clause provides that the council has power to authorize paving by the department of public works without resorting to competitive bidding by contractors. Under this provision the city can supplement the work of contractors unable to complete all desired paving promptly, and can provide greater use for the municipal asphalt plant, which has been utilized only in patching and resurfacing jobs. The charter provides that the cost of paving a street, which is assessed against abutting property owners, shall be determined by competitive bidding, but the newly discovered clause supplements this provision with authority for the council to direct the city to do the work, "if advisable," and determine the assessment on the cost when completed. The clause was inserted in the charter in 1899 for the express purpose of providing a weapon against fraudulent contractors, Mr. Dingeman said. Commissioner Fenkell sought to learn if his department could enter competitive bids against contractors for paving jobs, his object being to obtain sufficient work to keep the city asphalt plant going. The plant has had plenty of work but the prospects pointed to inability to use it to full capacity soon unless new paving jobs could be done by the city.

Michigan Road Law Again Upheld.

Lansing, Mich.—Following an opinion handed down by the supreme court, upholding the constitutionality of the Covert highway law, highway work in various stages of completeness throughout Michigan and representing approximately \$7,500,000, will be resumed. However, highway department officials say it will be too late this season to accomplish anything in the way of extensive work. The

supreme court's opinion affirms the decree of the Ionia circuit court which declares the act constitutional, notwithstanding the fact that it contains an inconsistent clause. The claim was advanced that a clause providing for maximum percentage limits would nullify the rule of assessing according to benefits. The courts hold that inasmuch as this clause is not an interdependent part of the rest of the statute "essential to accomplish its moving purpose and the chief object for which it was enacted," and that it might be eliminated and still leave a workable law, the act is constitutional. Two hundred and four road jobs, covering 1,100 miles of road, 700 miles of which is on trunk line highways, and representing a total cost of seven and a half million dollars hung on this decision. The work includes that started during the two years since the enactment of the law, and the completion of which will require two additional years, since the present year has been wholly lost. The decision also affected \$2,500,000 worth of road bonds already issued, which of course continue to be valid as the law is upheld. There was pending by petition two projects of 40 and 60 miles respectively of trunk line road on the East Michigan Pike; the former on the Huron Shore branch, and the latter on the main route of the pike. While the season is too far advanced to start the work this year, there is time to get ready for much road improvement next summer.

SEWERAGE AND SANITATION

Health Department Laboratories Need Supervision.

Washington, D. C.—A recent report of the United States Public Health Service brings out the need of more adequate supervision of and more careful work in the laboratories of city health departments. It says: "Recently in a city in New England an unusual number of cases of diphtheria was recorded. Study of the cases showed that the diagnoses were based upon laboratory examinations. Further inquiry revealed that during the period of the unusual prevalence the examination of diphtheria cultures in the laboratory had been carried on by two different men, the usual bacteriologist and a temporary substitute who did the work part of the time. The findings of these men differed widely. The substitute bacteriologist did the work from May 27 to June 2, and of 46 specimens submitted for diagnosis he found 33 positive and 12 negative. From June 4 to June 16, inclusive, the regular bacteriologist was on duty, and of 51 specimens examined he found 8 positive and 43 negative. From June 18 to July 7 the substitute was again on duty, and of 104 specimens examined he reported 77 positive and 27 negative. From July 8 to 10, inclusive, the regular bacteriologist was on duty, and of 18 specimens examined he found 2 positive and 16 negative. The apparent prevalence of a considerable outbreak of diphtheria was evidently due to the inexperience and lack of training of the substitute. In this connection one is reminded of the bacteriologist of the health department of a large city who, instead of examining his diphtheria specimens, threw them into the waste basket and marked the reports negative, a practice that was without serious result until a diphtheria epidemic assumed unusual proportions and was discovered only by accident."

Reorganizing Maine's Health Work.

Augusta, Me.—Dr. Leverett Dale Bristol, the new health commissioner of Maine, who assumed the duties of the office a few weeks ago, is now busily engaged in the organization of the department and trying to gather together experts for the various divisions which he will inaugurate. According to a statement, "so far as is possible members of the old board of health will be considered in appointments under the new health department law. I intend also to fill these new positions with residents of Maine. The law as passed by the last legislature stipulates that the state shall be divided into at least three sanitary districts, the head of each district being expected to devote all of his time to the work of his district. Perhaps later the number of the districts will be increased as the work progresses. Dr. Bristol contemplates dividing the organization into five divisions:

the divisions of communicable diseases, the sanitary engineering division, the division of diagnostic laboratories, the division of sanitary inspection and education and the division of vital statistics. The chief work in the division of communicable diseases will be the special study of communicable diseases and how they are transmitted. It will also be the duty of the director of this division to go to the community where the disease exists in an endeavor to determine the method of its spread, and in the case of typhoid fever to ascertain if possible where the disease originated. The study of water supplies and sewage disposal will be the principal work of the director of the sanitary engineering division of the health department, although he will be the director of the laboratory. His duty will include laboratory sampling and field work. The director of the divisions of diagnostic laboratories will determine the presence of disease germs in cultures and specimens. The last legislature made an appropriation of \$4,000 for each of the years 1917 and 1918 to give free of charge the Wassermann test for venereal diseases and the director of this division will have charge of this new feature. The director of the division of sanitary inspection and education will give lectures throughout the state, with lantern demonstrations, concerning the causes and prevention of diseases, show exhibits at county and state fairs and distribute literature on topics relating to the public health. The work of the division of vital statistics includes the collection of records of births, deaths and marriages, the causes of death and the like, all of which will be under the direction of Dr. Bristol.

Spread of Poliomyelitis in Virginia.

Richmond, Va.—Thirty cases of infantile paralysis were reported to the state board of health from seven counties and one city during the month of July. Three cases have been reported from the city of Richmond. Acting on the basis of this information, the state board of health has issued a bulletin of warning and called upon physicians to report immediately, as required by law, all cases of infantile paralysis. "Physicians owe it to the public, as well as to the law, to report immediately all cases that occur in their practice and immediately establish quarantine. Evasion of the law, in cases of this sort, is criminal and will be punished promptly and effectively. Some of the cases that have been reported are probably of the sporadic type and need not cause serious apprehensions. Other cases apparently are of the epidemic type and may be responsible for the future spread of the disease. All cases must be treated as though they were of the greatest danger, for only in this way can proper precautions be taken. The situation has not yet assumed proportions that make it necessary to give public warning against travel in all parts of the state, but it is serious enough to justify us in saying that children should not enter or leave Rockingham county. It may be necessary to add Page and Rappahannock to this list. The board is taking steps to confine the disease, if possible, to the present area of infection and is working in co-operation with the United States public health service. For the present, the most important measures of prevention are, first, the isolation of all cases, and, secondly, the sanitation of our towns, cities and rural districts. To this end, the board has written an urgent appeal to the councils and boards of supervisors and will rigidly exercise all the powers at its command." The total number of cases thus far for the year is sixty-eight. This is less than the number reported to the corresponding date in 1916.

Diphtheria Epidemic Stirs Newport.

Newport, R. I.—The reporting of several hundred cases of diphtheria, the addition of many new ones every day and the overcrowding of the hospitals have aroused the local and state health authorities to stringent measures. Several emergency hospitals have been quickly fitted up. The epidemic, it is thought, originated in milk and ice cream from a few stores and these have been closed. The naval training station has given the use of its hospital to accommodate patients. Conditions were complicated by the city's bacteriologist, Miss Tuthill, falling a victim to the disease herself. This necessitated the sending of cultures to

Providence until the bacteriologist of the state board of health, Dr. Harry S. Bernstein, could come to the city. Dr. B. U. Richards, of the state board, after investigation said: "Conditions in the diphtheria zone are very unusual. The zone extends from Jamestown to the north end of the island, centering in Jamestown, Newport and Portsmouth. The board is not able to say where the disease started, who was first afflicted and who was the carrier. The board, however, has come to the conclusion that the direct cause of the epidemic has been the wholesale distribution and consumption of ice cream. We have investigated thoroughly the source of the milk supply of the district and found that in many cases it is in a very faulty and insanitary condition. The raw milk used in the manufacture of ice cream has probably been the cause of the epidemic." At the beginning of the outbreak state and local authorities conferred and organized a committee with practically unlimited authority. An order was sent out, through the police, stopping the sale of all ice cream in any store, factory, hotel, restaurant, boarding house or drug store until the premises could be inspected. Warnings were sent out broadcast urging the citizens to pasteurize or boil milk, avoid ice cream and take other sanitary precautions. The organizations at work on the situation include the state board of health, the state agricultural board and the state board of pure food control and the state factory inspection department.

City Ordered to Remove Sewers.

Peabody, Mass.—By a rescript of the supreme court, Otis Brown wins his equity suit against the town of Peabody for an injunction against the maintenance of public sewers laid by the town in 1895 in Munroe and Hardy streets—private ways to which Brown claims title, while the town claimed that the streets had been open to travel for more than twenty years. The court orders a decree to be entered awarding an injunction and commanding the removal of the sewers within five months unless the town, meantime, shall acquire a legal right for maintaining them.

WATER SUPPLY

Report on Survey of Water Works.

Springfield, Ill.—That insurance rates will be raised unless certain minimum improvements are made in the Springfield city-owned water works is brought up for discussion and comment by the Sage Foundation report on city and county government in Springfield and Sangamon county. Moreover, insurance can actually be lowered and lower rates are promised if certain additional improvements are not unduly delayed. The equipment as far as pumps were concerned was found adequate when all factors of the present situation were taken into account. The need, however, of another trunk main laid along a new route from the pumping station to the city has been pointed out. Although these and other changes proposed "would affect very few insurance rates outside of the business districts, for the most part they represent much needed improvements, and should be made. The proposed new water main from the pumping station alone will cost about \$150,000 and is a clear necessity. A fund of 10 per cent of all meter revenue was being set aside to obtain money to lay this main. Again, probably \$50,000 must sooner or later be expended in replacing mains which the growth of the city has proved too small, and possibly \$100,000 more could be expended to advantage to meet suggestions made by the underwriters. Some of these are costs, however, which it is clear that the whole city should bear; and the necessary funds should be raised either by general taxation or by the issuance of city bonds." Moreover, many extensions are asked for by residents, but the impossibility in the past of meeting all these demands made "charges of favoritism and bad judgment possible; these tended to force the extension of the city mains as rapidly as possible into the newly developed districts, and it all added to department costs.

"Some other cities have found a very fair way to meet the difficulty was to install new mains upon the payment by lot owners of a flat rate of, say, \$15 for each forty-foot lot. Of course this does not pay for the construction of the larger mains, but the cost above this amount should in any event be made a general charge over all the city.

"It is true also that heretofore mains have been laid without charge by the municipality; but since it is impossible now to extend the system as rapidly as requested without putting a too heavy burden upon the consumers of city water, a change from past methods seems warranted. Besides, the plan suggested would not be working present builders any injuries, for the city would be given a tangible value return to them for the payment required. In other words, the value of their lots, through having city water service, would be increased at least by the amount that the improvement had cost them. This equitable method of financing new extensions would reduce present Springfield rates about 20 per cent.

"The water department is to be congratulated on the practically complete installation of water meters. This very general use of meters was probably the chief factor in a reduction of the per capita consumption of water from 125 gallons in 1906 to about eighty-five gallons in 1916. In the same period the water consumption per consumer of city water was reduced from 217 to 123. The Springfield water department has corrected a very common fault by instituting a periodic test of the accuracy of water meters. The first general tests made in 1911 and 1912 are said to have shown an average loss to the city of nearly 40 per cent. Meters are now tested biennially, and the loss of water greatly reduced." In this connection Springfield is reminded of the uncertainty as to the bonded past of the water works.

"To secure the original water works, the city in 1867 issued bonds to the amount of \$467,000. The original bonds have been retired, but other bonds have been issued, and the bonded debt of the city remained greater when the survey was made than the amount of the original issue for the water works. Whether the old water bonds, or the bonds issued to refund them, have been actually paid off, cannot be ascertained from the records; and for the amount, at least, it is of no particular importance. The important question is as to the extent that the water works have given money to the city to retire bonds and pay the interest upon them, regardless of what the city did with the money."

The Sage Foundation surveyors found that the records of the department and of the city, particularly prior to 1890, were deficient; they were in such condition that it seemed impossible to obtain any accurate information on what part of the present water plant, if any, had been paid for by the taxpayers in other ways than through water revenues. From material available, however, it appeared a safe estimate that at least \$500,000 of the cost of water equipment, which included other property, of course, than the original works, had been bought with city money, strictly speaking, and that this amount had not been paid back to the city by the water department—in other words, that about \$500,000 of the city debt was due to expenditures for the city's water works system. The value of the property was about \$1,000,000. Thus it would appear that the water department had paid out of net receipts from water rates about one-half of the cost of the present equipment, or about \$500,000.

Control Sprinkling to Conserve Supply.

Lincoln, Neb.—Alleging that too many of the citizens of Lincoln refused to voluntarily assist the municipal water plant in overcoming the present emergency, the city council has passed an emergency ordinance dividing the city into two districts for the use of water on lawns and gardens. Those living south of K street may sprinkle their lawns and gardens on the even numbered days. Those living north of K street may use water on odd numbered days. Water is to be used for sprinkling purposes only between 5 and 8 p. m. A fine of \$100 may be assessed for violation of the ordinance. Mayor Miller gave the police department copies of the ordinance with instructions to arrest the violators. Commissioner Schroeder also furnished the department with a list of those who had recently violated the orders to stop sprinkling in the past few days. Hose, pipe and any other device not equipped with a sprinkler or nozzle are strictly forbidden by the city. Every pipe or hose used for the conveying of water to the lawns must be equipped with a sprinkler or nozzle. There are 12,000 consumers in the city.

Waterworks Fireman Bravely Holds Post.

Philadelphia, Pa.—On one of the recent broiling hot mornings, for an hour and a half 66 per cent of the city's supply of water, furnished by the Torresdale water plant, was dependent upon the sole efforts of a single negro fireman. Four others who formed the regular shift at that time were incapacitated by the abnormal heat and did not appear at the accustomed hour. But the lone volunteer undertook his task at the boilers manfully and fought off exhaustion for the long ninety minutes until substitute firemen could be found to help him. The officials have been agitated at the thought of what would have been the consequence of an outbreak of fire at that time. With a water

pressure of only six pounds to the square inch, the lowest ever recorded in the city, little resistance would have been offered to the rapid progress of a general conflagration. Chief Davis' appeal for more men at the filtration plant was denied by councils shortly before adjournment. In spite of competition with munitions factories, the somewhat remote location of the Torresdale plant and depletions by draft, a higher rate of wages was also refused by that official body. As manned at present, the plant is capable of turning out an average of 280 gallons a day for each person in the district served. Yet even when running at the full, production is overtaxed by reason of wastage. Chief Davis is increasing the vigor of his campaign against water wastage.

STREET LIGHTING AND POWER

Provincial Commission Takes Over Big Plant.

Niagara Falls, Ont.—The Provincial Hydro-electric Commission is now in full control of the Ontario Power company's plant here. The plant was recently purchased by the commission for twenty-two million dollars, thirteen million of which is represented in bonded indebtedness to the company. In acquiring the Ontario Power company, Sir Adam Beck considers that the company, which is the largest and most efficient developing concern on the Canadian side of the Niagara river, will form an important link in the Chippawa Creek-Queenstown Heights developing scheme, the ultimate capacity of which will be 900,000 horsepower, six times more horsepower than is now being sold by the commission's great Niagara system. The Ontario Development company has a franchise development of 180,000 horsepower, which with an additional conduit could be increased to 240,000 horsepower. The commission is spending \$15,000,000 on the Chippawa scheme, which will probably absorb the Ontario Power company's system in the course of a few years.

Sweeping Decision for Kansas Natural Gas Company.

Kansas City, Kan.—The U. S. district court at Minneapolis, through judge Wilbur E. Booth, sitting in the Kansas gas case, gave out a sweeping decision favoring the company on several issues. Judge Booth held that the contracts between the Kansas Natural Gas Co., and the distributing companies were not binding upon the receiver. He also decided that the gas furnished the Missouri cities involves interstate commerce, placing the public utilities commission of Missouri upon the same basis with reference to the case as that occupied by the public utilities commission of Kansas. Judge Booth also indicated, although he did not hand down a decree, the rates to be put into effect in all the cities served by the Kansas Natural. Lawrence and Topeka will pay 60 cents per 1,000 cubic feet. The same rate will apply in other Kansas cities, in St. Joseph, Atchison, Leavenworth and all other towns north of Thayer, Kan. Thayer and all towns south of Thayer will pay 50 cents per 1,000 cubic feet. Coffeyville, Independence, Parsons and Elk City, which are supplied from local fields and which are not dependent upon the Kansas Natural Gas, will have an average rate of about 30 cents. The basis of division between the Kansas Natural and the distributing companies will be operating expenses for each plus 50 per cent of the profit. In other words after all expenses of operations are paid the receiver for the Kansas Natural and the distributing companies will split what is left. These rates are based on a probable supply of 20,000,000 cubic feet of gas daily to the consumers of the entire system, the experts in attendance at court figuring that this will do the cooking and lighting for the territory covered by the Kansas Natural. Henry L. Doherty was given permission to take up his pipe line extending from the "Hogshooter" field to Iola, Kan. This pipe will be turned over to the receiver of the Kansas Natural for use in connecting the Blackwell field with the Kansas Natural lines. This shift was made necessary because it is now impossible to buy gas pipe in the market. In return the Kansas Natural is to carry gas to the consumers deprived of gas service by the taking up of the "Hogshooter" Iola line. Mr. Doherty believes that he will be able to increase the output of the Kansas Natural 40,000,000 cubic feet a day by this shift. The develop-

ment work which Mr. Doherty has done and is doing will cost him about \$2,500,000 this year. Judge Booth refused to entertain the plea of the Kansas City Distributing company for a \$1 rate. He also refused to entertain the plea of the Topeka Distributing company for a 90-cent rate. He indicated that the plan of a graduated increase in the price of gas from the small consumer to the large consumer is unscientific rate-making. On the other hand he indicated that it is his judgment that the rate should be gradually reduced to the large consumers. The rate will be a temporary one, but it doubtless will hold throughout the winter. Kansas City, Mo., will pay 60 cents for its gas.

City Protests Company's Rates.

Gary, Ind.—Revolt against the rates and tactics of the Gary Heat, Light and Water company, a subsidiary of the United States Steel Corporation, has broken out in the city council. Attacks were made on the company from three sources. People living on lots that were bought in subdivisions not owned by the Gary Land company, the realty and renting department of the steel trust, pleaded for water. Councilmen declared that in certain districts steel workers and their families had to get their water from the horse troughs that saloon keepers have in front of their place, and mayor R. O. Johnson, in a formal message to the council, pointed out existing high rates and asked that the city protest against the general appeal of Indiana utilities companies for higher rates. This the council voted to do. Mayor Johnson compared Gary rates with those of Chicago and of other Indiana cities. He pointed out that since gas, electricity and the power that pumped water from Lake Michigan were produced from by-product gas made at the Gary plant of the Indiana Steel Company, also a steel trust subsidiary, that these things should be cheaper here than elsewhere. The local steel company sells its power to its sister subsidiary, the heat, light and water concern, and, producing these commodities on a vast scale, is supposed to do it at a low rate. Dollar gas in Gary was compared with 70 cent gas in Chicago, and the minimum rate of \$1 here was cited in comparison with the lower minimum rates of other Indiana cities. Water, which sells here at 30 cents a thousand gallons, was cited as costing four times as much as does water in Chicago, and the rates for electricity also were assailed. The mayor denounced local rates as exorbitant and pointed out that while the Gary concern had not joined in the general petition for higher light rates it would benefit from them. Figures showing the profits and surplus of the company were cited. The council ordered that petitions be circulated through the city calling for lower local rates. The council for more than two years has locked horns with the utilities company for not extending water service to certain parts of the city. A municipal water works was once ordered built by voters, but the company gave in and a compromise was reached whereby the city guarantees that the steel subsidiary is to have 10 per cent on its investment. John Keseric, councilman, and Harry Sulzbaugh, safety commissioner, declared that citizens in one section either had to use yellow surface water or go as far as a quarter of a mile and carry water from a trough used for horses. R. E. Houren, councilman, pointed out that the water company readily extended its mains and fire plugs to the steel trust's real estate subdivisions long before a single house was built on them.

Win Step in Long Fight Against Poles.

New York, N. Y.—Residents of the thirtieth ward section of Brooklyn have won what they regarded as an important success in their long fight to compel the removal of electric light poles and wires from the streets of that district. supreme court justice Benedict decided that the Edison Electric Illuminating Company should appear in court to defend its use of the streets in the Bay Ridge-Borough Park-Bath Beach section for carrying electricity to private consumers. The alternative writ of mandamus is directed against borough president Pounds of Brooklyn and the commissioner of Water Supply, Gas and Electricity. The question of whether the poles and wires are to remain will be decided at the hearing on the writ, to be held in the fall. The fight for the removal of the poles was started about eight years ago. Corporation counsel Archibald Watson

held that the electric light company had no legal right to the use of the streets, but the company obtained an injunction restraining the city from removing the poles and wires. The matter was sent to a referee, who sustained the opinion of the corporation counsel. It was alleged, however, that despite this the authorities continued to issue permits for the erection of poles and the stringing of wires. In granting the writ, Justice Benedict said the charters of the old city of Brooklyn or the amendments thereto up to the time of consolidation did not give the common council of the former city power to grant franchises for supplying electric light, heat, or power except for public use, such as street and park lighting. "This, however," the court says, "would not confer upon the company the right to furnish light, heat or power to abutting owners for profit." In its answer the company declared that it furnishes light and heat and power to many municipal buildings and plants and to some ten thousand private consumers in the Thirtieth Ward and that it has expended \$160,000 above the surface and \$740,000 beneath the surface of the streets in that ward, in addition to more than \$2,000,000 in the construction of its generating plant. Justice Benedict says that the company's contention of a franchise "by acquiescence" and non-interference with the installation of this vast equipment is unsound, and that no right can be claimed from the fact that the state legislature acted in accordance with a belief that the company had a legal valid franchise. Justice Benedict also expresses regret that the company, in its answering brief, had seen fit to denounce the plaintiff as a "malicious meddler." "The law is no respecter of persons, and it ill becomes the counsel for a public service corporation, drawing its sustenance from the generous breasts of the public, to attack the motives of an antagonist upon the ground that his occupation is lowly. In the eyes of some persons the relator's occupation (painter and paperhanger) might be regarded as quite as honest as that of the defendant corporation." Consideration of the allegations in the petition and the answers interposed by the Edison company and the city official prompted Justice Benedict to deny the request for a peremptory writ, which would compel the officials to begin at once the ripping out of the company's poles and other equipment which are on or under the public streets. He granted, however, an alternative writ, which compels the company to come into court.

FIRE AND POLICE

Police Strike Wins Higher Pay.

South Bethlehem, Pa.—After a few hours' strike the policemen of the city won from the borough council an increase in pay of \$11 per month. Under the new schedule the chief will receive \$102 per month, sergeants \$96 and patrolmen \$90. Chief Daniel Gallagher was away on his vacation. When chairman Hartjan of the council market committee reported that the market receipts were \$1,000 in excess of the estimate passed on last year, \$935 was transferred to the police fund to pay for the increase during the rest of the year.

Chicago Aldermen Study Saloon Problems.

Chicago, Ill.—Members of the city council committees on licenses and on schools, fire, police and civil service have left for the east to study police and saloon conditions in New York, Boston and other cities. The committee on licenses, of which alderman John Toman is chairman, proceeded direct to Boston. The other committee, under alderman Franz, left the Toman party at Buffalo and are visiting Canadian cities to study police methods and stations. The Toman party includes aldermen Toman, Anderson, Fetzer, Woodhull, Krumlick, Novak, Horne, Smith, Bowler, Ellison, Roeder, Byrne, O'Toole, Long, Clark and William F. Harragh, sergeant at arms of the city council; the Rev. John P. Brushingham, secretary of the morals commission; George F. Lohman, deputy city collector; James W. Breen, assistant corporation counsel, and Frederick Rex, municipal reference librarian. Eleven subjects

bearing on the investigation with a total of 127 questions will be used by the Chicago "questionnaire" commission. The subjects are: "The Saloon in Relation to Municipal Revenue." "The Saloon in Relation to Public Morals." "The Saloon in Relation to Public Amusements." "The Saloon in Relation to Public Regulation and Control." "The Granting and Revocation of Saloon Licenses." "The Saloon in Relation to Business, Industrial, and Residential Districts." "The Saloon in Relation to the Dependent, Defective, and Delinquent Classes and to Gambling." "The Saloon in Relation to the Treating Habit." "The Saloon in Relation to Breweries, Wholesale and Producing Interests." "The Saloon in Relation to Law Enforcement and Pernicious Political Activity." "The Saloon in Relation to Proposed Measures of Constructive Reform and Improvement." Three thousand dollars was granted the two committees for expenditures on the investigation.

Increased Pay for Police and Firemen.

Indianapolis, Ind.—An ordinance providing for an increase in pay of about 20 per cent for all city firemen has been passed by the city council over the veto of mayor Bell. The ordinance will become effective January 1. Another ordinance that would give members of the police department an increase in pay of about 20 per cent has been introduced by Thomas C. Lee, and it is believed that it will be passed. The police measure also would become effective January 1. It is estimated that the increases in pay provided for the firemen will amount to about \$80,000 a year, and that the proposed increases for the police would amount to about \$110,000 annually. The police ordinance would leave the salary of the superintendent of police at \$4,000 a year. This salary is fixed by state law and cannot be changed. The proposed salary increases follow: Inspector of police, from \$2,100 to \$2,800 a year; police captains, from \$1,740 to \$2,000 a year; lieutenants, from \$1,500 to \$1,700 a year; sergeants, from \$1,320 to \$1,500 a year; bicyclemen, turnkeys, trafficmen and mounted men, from \$3.50 to \$3.75 a day, and patrolmen, from \$3 to \$3.50 a day.

Firemen Win Pay Increase by Strike.

Walla Walla, Wash.—After endeavoring to secure a new force to take the place of the firemen, including the chief of the department, who struck for \$15 a month salary increase, mayor Mike Toner, head of the police and fire departments, granted the demands of the men. When the firemen walked out, the mayor announced he would fill their places, but being unable to do so called a meeting of the city commission, where a decision to grant the demands was reached. For more than an hour the city was without fire protection and fire underwriters kept the city officials busy with complaints and warnings. Formal application for an increase in salary was made by the firemen several months ago, when petitions which had been circulated among the business men of the city were filed. Practically all lines of business were represented on the petitions, but the commissioners had taken no action, and the firemen finally agreed upon a different course of action. In behalf of their demand for an increase, the firemen cite the increase in the cost of living, and point out the difficulty that has been experienced since the first of the year in keeping men in the department. It is said there have been more changes in the personnel of the companies in the past eight months than for several years, due to low salaries paid new men, and the efficiency of the fire-fighters has been maintained only with a maximum amount of effort. "When it is considered that we put in 24 hours a day for the city and are allowed but an hour off for meals, even then being subject to call," said a representative of the firemen, "the request for an increase cannot be regarded as unjust." There has been no increase in pay of the firemen, they claim, since July, 1908.

GOVERNMENT AND FINANCE

Special Election on \$18,000,000 Improvements.

St. Louis, Mo.—A special election, to be held November 6, on bond issues aggregating \$18,840,000, has been approved of the board of aldermen and the mayor. The bond issue

will include the following items, each of which will be adopted if it receives two-thirds of the votes cast at the election: Proposition 1—\$9,915,000 for the improvement of River des Peres by widening and deepening it to carry off the foul and storm water; the construction of a connecting railroad, a driveway and viaducts. Proposition 2—\$2,825,000 for the construction and reconstruction of public sewers. Proposition 3—\$2,100,000 for the acquisition of public parks and playgrounds, the erection of shelter buildings, public comfort stations and park buildings and roads. Proposition 4—\$2,000,000 for the construction of a municipal convention hall. Proposition 5—Three hundred and sixty thousand dollars for a municipal farm. Proposition 6—One hundred and fifty thousand dollars for the improvement of Koch hospital. Proposition 7—One million dollars for a southern approach to the free bridge. Proposition 8—Five hundred thousand dollars for bridges and viaducts. The aldermen provided by amendments that the River des Peres fund might be used also for the establishment of industrial districts, and that the municipal farm might be used as a place of detention for anyone convicted of a misdemeanor. The election will cost taxpayers about \$70,000, and if all the bonds are voted it will exhaust the present limit of the city's bonded indebtedness. Action by the council followed requests by many civic and business organizations which had approved the plans of the City Plan Commission. Harland Bartholomew, engineer for the City Plan Commission, explained that the \$9,000,000, approximately, which would be devoted to the improvement of River des Peres, and the construction of a boulevard and railway along its banks, would have to be spent by the city in all likelihood, even if a long delay were decided on in an effort to get St. Louis county to pay its share of such improvements. Bartholomew explained that if the entire river were included in a drainage district, St. Louis would have to pay four-fifths of the cost of improvements, and it would equal the amount which it is proposed to expend. If the city issues bonds and improves the river now, it will not have to stand any part of the expense of future improvements in the county.

Many Employees Dropped.

Oakland, Cal.—As a result of the investigations and on the recommendation of the Civil Service Board, initial action on the wholesale abolition of "superfluous positions" in the departments of streets and public works and consolidation of others has been started by the city council. The recommendations of the Civil Service Board call for the immediate ousting of about thirty-three employees with a yearly saving to the city of about \$44,322. This action was taken as a result of the economy movement inaugurated by mayor John L. Davie when he assumed office.

Lighting, Fire and Police Cut After Revenue Loss.

Springfield, Ill.—Every fire station in the city with the exception of those in the downtown district was closed, street lights are turned off at midnight, the city police department has been materially reduced, city hall employees work by the day instead of by the month, gas and meter inspectors will be eliminated and there will be other material reductions in the service and force of employees working for the city as the result of the recent election. The overwhelming defeat of the proposed corporate tax increase, depriving the city of some \$124,000 revenue city commissioners had hoped to raise to partially make up the deficit in funds for operating expenses of the corporate government caused by the loss of an income of \$145,000 during the present year, make all of these things necessary, according to members of the city council. The statement prepared for publication, and signed by the entire city commission, was as follows. "By their vote the people of Springfield decreed that their city should exist on an income about one-half sufficient to meet the cost of the services the city now renders. The city commissioners have no choice other than to accept the verdict rendered and reduce departments to approximately one-half their present effectiveness. This remains the only choice available because the city, by the result of the election, is deprived of credit. It therefore has no means of securing money with

which to meet its ordinary operating expenses for the balance of the present fiscal year, which expires February 28, next. A favorable vote would have given the city \$124,000 of the \$145,000 loss which the city has sustained in its revenues in the past year through causes well known to the public." Seven department heads and three city employees were the first to feel the "guillotine," when city commissioners agreed to dismiss them at once and eliminate an annual expense of \$11,560 from the city payroll. Dr. O. H. Deichmann, superintendent of health, under commissioner Reece, was one of the officials to lose his position. His annual salary was \$1,200. Electrical inspector James D. Valentine, in the same department, was dismissed and his \$1,350 salary cut off the payroll. Meat inspector John Breustle and infant welfare nurse Mary F. Wilson, also in commissioner Reece's department, were discharged. Those in commissioner Hamilton's department to lose their jobs were sewer inspector John Requarth and sidewalk inspector William Gaessler. In mayor Baumann's department, gas and meter inspector Charles H. Lanphier and assistant, Joseph Kleisner, with a total salary of \$2,190, lost their offices. Lanphier has agreed to give his services free to the city as gas and meter inspector.

Cities Fight Anti-Municipal Ownership Bill.

Atlanta, Ga.—Cities throughout the state are up in arms to defeat again state legislation intended to cut off all possibilities of future erection of municipal utility plants. Mayor John C. Cook, of Columbus, has enlisted the aid of the city officials and civic and commercial bodies of other cities and all efforts are being used to oppose the bill. It has already been reported on favorably to the judiciary committee No. 2 of the house of representatives. It would prohibit the erection, in any municipality, of municipally-owned public utility plants where plants are being operated by private capital, unless the permission of the Georgia railroad commission is first secured. A similar bill was introduced and passed in the senate during the session of 1916, and was only defeated in the house by the combined opposition of the various municipalities of the state of Georgia. At the present session, the various power, street railroad, electric and gas lighting companies, and other public utilities, are strenuously working through several lobbyists to bring about the passage of this bill. Resolutions passed by the council of Savannah say that the bill would deprive "cities and other public corporations of rights they now enjoy and permanently insure monopoly in the matter of public utilities." They charge that the bill "is solely for the interests of privately owned public service corporations and that it seeks to perpetually establish monopoly and to hamper to the point of destruction the right heretofore enjoyed by all municipalities of encouraging competition or establishing and operating plants of their own for the protection and promotion of the public interest. If the bill is enacted, if there is anywhere in the district so much as a line for the distribution of electrical current, the burden and expense is placed upon a municipality desiring to operate its own plant of procuring the approval of the Railroad Commission of the construction, maintenance and operation thereof, and, in addition, the judicial determination by this commission that such a plant is absolutely required. The power to operate public utilities is a valuable protective right which should be exercised by the municipality for the good of the people, and should not be destroyed in the interest of monopoly."

Forty-Four Per Cent of Engineer Corps Dismissed.

Portland, Ore.—Plans for the complete reorganization of the engineering corps of the department of public works, involving the dropping from the pay rolls of 55 employees or 44.2 per cent of the entire city engineering corps, have been announced by commissioner Barbur. In the list of those whose services were dispensed with August 1 are heads of bureaus, engineers, instrumentmen, draughtsmen, computers, clerks, stenographers and inspectors. The dismissals are expected to result in a net saving in pay rolls of \$64,500 annually. In issuing his orders commissioner Barbur announces that while he has made no changes for the present in the office of the chief clerk and the building in-

spection bureau, he plans their reorganization in the near future. City engineer Laurgaard, on whose recommendations the changes are made, is of the opinion that the building inspection bureau should be either directly in charge of the city engineer or transferred to the department of public safety. He also favors transferring much of the clerical work of the department to the city auditor's office. Civil service rules have been observed in the reorganization. Each of the employees will be informed that his or her services no longer are needed and that his or her name will be placed on the civil service eligible lists from which the original appointment was made. The rule is that the last appointed to any position in a classification shall be the first to be laid off in case of a reduction in the force. The shakeup completely breaks up the big organization of former commissioner Dieck. Many of the employees dismissed have been in the service eight and ten years. "For the present we are attempting little new construction work, and the big force of employees is not needed," said commissioner Barbur. Among those hit by the shakeup are W. P. Hardesty, chief of the bureau of surveys and draughting; J. C. Sharp, chief of the bureau of sewers; C. H. Smith, sewer engineer. J. R. Hanson will remain assistant city engineer; R. E. Kremers, chief of the bureau of highways and bridges; Charles H. Wanzer will be made chief of the bureau of streets, a new bureau which will be created; R. G. McMullen will be chief of the bureau of sewers, and Jesse Hannam will be chief of the bureau of surveys and draughting.

MISCELLANEOUS

Enforcing New Billboard Law.

Hartford, Conn.—The state police department, following notice, is enforcing rigidly the new law relating to billboard licenses and restrictions. Applications for licenses had to be filed by Aug. 1. The license fee is one-half cent per square foot per annum, the space to be computed by measurements to the outer edge of all frames, billboards, etc. The only exemptions are: (1) Signs containing less than four square feet. (2) Signs on the property upon which the goods advertised are manufactured or offered for sale, or upon which the business advertised is carried on, wholly or in part. (3) The advertisement by any town, city or borough of its industries. A separate application and license is necessary for each and every advertisement or space structure so used or offered for rent. No license will be issued for any sign that obstructs the view from the highway of steam or electric tracks within 300 feet of any grade crossing. Some of the features of the law follow:

The application for such licenses state: (1) The location of the property upon which it is proposed to display such advertisement; (2) the population of the city, borough or town within which the same is to be displayed; (3) the distance of the location of such advertisement from any crossing at grade of a public highway and the tracks of a steam railroad or electric railway, if such distance be less than three hundred feet; (4) the size and a general description of such advertisement.

Sec. 2.—The fee for such license shall include all of the space within a line drawn around the outer edge of such advertisement, or if such advertisement is upon, attached to or a part of any billboard, frame, network, transparency, or other form of construction, such line shall be the outer edge of such construction and each surface or space displaying any name, word, symbol, character, picture or letter shall be construed to be an advertisement. Upon the receipt of such application and fee, the superintendent of state police shall issue a license for each such advertisement, which license shall permit the holder thereof to display such advertisement for one year from the date thereof, and each such advertisement shall include the number of such license and date of expiration.

Sec. 3.—The superintendent or state police may issue to any person owning or leasing any space for advertising purposes, a license authorizing the use of such space for such purpose, upon payment by such person of a fee determined as herein provided. Such space shall plainly show the number of such license and the date of expiration. Any advertisement placed upon any such surface shall be exempt from the payment of any license fee during the period for which such space is so licensed.

Sec. 4.—The licensing and inspection of billboards, and all advertisements displayed thereon, the issuing of the license herein provided for and the enforcement of the provisions of this chapter shall be under the control of the state police department.

Sec. 5.—No owner or lessee of real estate or any interest therein shall lease or license any part of such real estate in this state to any person, for the display of advertising matter until such proposed lessee shall have obtained a license in accordance with the provisions of this act.

Sec. 6.—No license shall be required under the provisions of this act from any town, city or borough for any advertisement owned by it and advertising its industries and maintained at either public or private expense.

Sec. 7.—Any person or the managing agent of any firm or corporation violating any provision of this act shall be fined not more than thirty dollars or imprisoned not more than thirty days. Each month that any advertisement is displayed in violation of any provision of this act shall constitute a separate offense.

Begin on Harrisburg Capitol Improvements.

Harrisburg, Pa.—Governor Brumbaugh recently approved the bill appropriating \$350,000 for the preliminary improvements to the Capitol Park extension area—grading and filling—and gave orders that the tract be cleared by August 15. There were still, when the order was given, many persons living in the zone, by permission of the commonwealth which has taken over their buildings, two synagogues were still in use, two engine houses were occupied and a dozen buildings were used for state departmental purposes and armory purposes. At the same time it was announced that nine of the properties in litigation had been added to the eighteen buildings that were put up at public auction. Superintendent George A. Shreiner of the department of public grounds and buildings, at once began work and conferences were arranged with Arnold W. Brunner, the New York architect, and Warren H. Manning, the Boston landscape architect, both experts in the state's employ, regarding the matter. The city's part in this program will be to find other places for the fire apparatus of the Citizen engine company and the Mt. Vernon Truck company. The state has a bigger problem facing it. There are about a dozen of the buildings in the zone used for state departmental purposes. These must be moved to offices and places where rent must be paid. Among the state departments affected are the State Live Stock Sanitary Board of the Agricultural department, the bureau of chemistry, of the same department; the state highway department garage; the adjutant general's department storage building; the bureau of engineering, public service commission; the division of distribution of documents of the Department of Public Printing and Binding; the employment bureau of the Labor and Industry department.

Ocean Terminals Built by U. S.

Washington, D. C.—Finding that existing ocean terminals are entirely inadequate for the coming demands of shipping the Council of National Defense has created an advisory commission on terminal facilities, to cooperate with the general munitions board and with the sub-committee of the board on storage facilities. The committee is investigating the ocean terminals of the country for the use of war-supply vessels. It is practically certain that new terminals are to be built especially for handling army supplies. Exports will greatly increase in volume as soon as the ships to be produced by the Emergency Fleet Corporation and the Shipping Board are provided, and the advisory commission on terminal facilities will make a study of this subject as well as the physical engineering features connected with the present terminals and the probable needs of the future. Unnecessary freight hauls will be eliminated it is expected, releasing cars and locomotives for inland transportation. Frances Lee Stewart, consulting engineer, formerly chief engineer of the Baltimore & Ohio R. R., representing the port of Baltimore, will be the chairman. Representatives for New Orleans and Boston have not yet been selected. Others so far named to serve on the new organization are as follows: B. F. Cresson, consulting engineer, 50 Church St., New York, designated by the State of New Jersey to represent the New Jersey sections of the ports of New York and Philadelphia; R. A. C. Smith and Charles W. Staniford, respectively commissioner and chief engineer of the Department of Docks and Ferries of New York City, designated by the mayor of New York to represent New York's waterfront and the port of New York; J. B. Locke, secretary of the Newport News Chamber of Commerce, designated by the Virginia Corporation Commission and the mayor of Newport News; and W. A. Cox, secretary and traffic manager of the Norfolk Chamber of Commerce, designated by the Virginia Corporation Commission and the mayor of Norfolk.

NEWS OF THE SOCIETIES

Calendar of Meetings.

Aug. 15-17.—LEAGUE OF WISCONSIN MUNICIPALITIES. Annual convention, Racine, Wis. Secretary, Ford H. MacGregor, Madison, Wis.

Aug. 21-23.—NEW YORK STATE FIREMEN'S CONVENTION, Flushing, N. Y. Secretary, Thos. Honohan, Frankfort, N. Y.

Aug. 22.—UNION OF NEW BRUNSWICK MUNICIPALITIES. Annual convention, St. John, N. B. Secretary, James King Kelley, St. John.

Aug. 27-29.—UNION OF CANADIAN MUNICIPALITIES. Annual convention, London, Ont. Secretary, W. D. Lighthall, K.C., Westmount, Que.

Aug. 29-31.—UNION OF NOVA SCOTIA MUNICIPALITIES. Annual convention, Truro, N. S. Secretary, Arthur Roberts, Bridgewater, N. S.

Aug. 29-31.—ONTARIO MUNICIPAL ASSOCIATION. Annual convention, Toronto, Ont. Secretary, B. H. Spence, 705 Lumsden building, Toronto, Ont.

Sept. 10-15.—NATIONAL EXPOSITION OF SAFETY AND SANITATION. Annual conference, New York, N. Y. Secretary, W. C. Cameron, Continental and Commercial Bank building, Chicago, Ill.

Sept. 11-13.—AMERICAN ASSOCIATION OF PARK SUPERINTENDENTS. Annual convention, St. Louis, Mo. Secretary, Roland W. Cotterill, 533 City Hall, Seattle, Wash.

Sept. 11-14.—INTERNATIONAL ASSOCIATION OF MUNICIPAL ELECTRICIANS. Annual convention, Niagara Falls, N. Y. Secretary, Clarence R. George, Houston, Tex.

Sept. 11-14.—NEW ENGLAND WATERWORKS ASSOCIATION. Annual convention, Hartford, Conn. Secretary, Willard Kent, 715 Tremont Temple, Boston, Mass.

Sept. 18-20.—LEAGUE OF IOWA MUNICIPALITIES. Annual convention, Iowa City, Secretary, Frank G. Pierce, Marshalltown, Ia.

Sept. 18-20.—LEAGUE OF VIRGINIA MUNICIPALITIES. Annual convention, Lynchburg, Va. Secretary, L. C. Brinson, Portsmouth, Va.

Sept. 24-29.—LEAGUE OF CALIFORNIA MUNICIPALITIES. Annual convention, Santa Rosa, Cal. Secretary, Wm. J. Locke, Pacific Building, San Francisco, Cal.

Sept. 25-27.—SMOKE PREVENTION ASSOCIATION. Annual convention, Columbus, O. Secretary, Frank A. Chambers, City Hall, Chicago, Ill.

Sept. 27-29.—AMERICAN AND CANADIAN ENGINEERS AND ARCHITECTS OF NORWEGIAN BIRTH OR DESCENT. Informal congress and re-union, Chicago Norske Klub, Chicago, Ill. Chairman, Committee on Arrangements, Joachim G. Glaver, consulting engineer, Chicago, Ill.

Oct. 9-12.—LEAGUE OF KANSAS MUNICIPALITIES. Annual convention, Wichita, Kan. Secretary, C. H. Talbot, University of Kansas, Lawrence, Kan.

Oct. 15-17.—NATIONAL HOUSING ASSOCIATION. Annual conference, Hotel La Salle, Chicago, Ill. Secretary, Lawrence Veiller, 105 East 22d St., New York City.

Oct. 17-18.—LEAGUE OF MINNESOTA MUNICIPALITIES. Fifth annual convention, St. Cloud, Minn. Secretary-treasurer, Richard R. Price, University of Minnesota, Minneapolis.

Oct. 22-24.—AMERICAN CIVIC ASSOCIATION. Annual meeting, St. Louis, Mo. Secretary, Richard B. Watrous, 914 Union Trust building, Washington, D. C.

Nov. 19-24.—CITY MANAGERS' ASSOCIATION. Annual meeting, Detroit, Mich. Secretary, W. L. Miller, City Manager, St. Augustine, Fla.

Nov. 20-23.—PLAYGROUND AND RECREATION ASSOCIATION OF AMERICA. Recreation Congress, Milwaukee, Wis. Secretary, H. S. Braucher, 1 Madison Ave., New York, N. Y.

Nov. 21-24.—NATIONAL MUNICIPAL LEAGUE. Twenty-third annual meeting, Hotel Statler, Detroit, Mich. Secretary, Clinton Rogers Woodruff, 703 North American Bldg., Philadelphia, Pa.

Conference of Regulating Boards.

A call has been sent to the members of all public service, utility and railroad commissions in the United States for the twenty-ninth annual convention of the National Association of Railway Commissioners to be held in Washington October 16. Active co-operation of the association "in the matter of federal control over operation of railroads to meet military and industrial requirements" will be among the subjects to be discussed. There are regulating committees in forty-seven of the forty-eight states of the union, Delaware being the sole exception.

National Association of Purchasing Agents.

The annual congress of purchasing agents under the auspices of the National Association of Purchasing Agents will be held at Pittsburgh, Oct. 9, 10 and 11. The program includes business sessions for the mornings and visits to and inspection of industrial works during the afternoons.

New York State Firemen's Association.

The committee in charge of the State Firemen's Association convention, which will be held this year in Flushing, the latter part of August, have plans under way for making the affair one of the largest events ever held in Flushing.

The parade and tournament on the last day, August 24, will be the feature. Three prizes will be awarded in each event in the tournament. The events will be an efficiency contest, hook and ladder contest, ladder climbing contest, dry hose contest, horse hose contest, motor hose contest, motor hook and ladder contest, wet hose contest and many others. These events will be held on Broadway, opposite the Flushing Town Hall. The events have attracted fire companies from all parts of the State.

City Clerks' Association of New York.

The City Clerks' Association of the State of New York is holding its 10th annual convention at Glens Falls (Aug. 16, 17 and 18). Albert L. MacMaster, city clerk of Rome, is the secretary and treasurer of the organization. The headquarters of the association are at Hotel Ruliff. The sessions of the convention are being held in the city hall, and the program being carried out is as follows:

Thursday, Aug. 16, 2 p. m., opening session—Address of welcome, Hon. Edward Reed, mayor of Glens Falls; response and opening remarks, Joseph S. Hanlon, president, city clerk, Auburn; "The City of Glens Falls," B. F. McCreery, president chamber of com-

merce; "The City Clerk," Earl E. Hall, city clerk, Glens Falls; reading communications, minutes of previous session and reports; topic, "Has the War Situation Produced Legislation Which Actually Increases Home Rule?" Discussion opened by David E. Pugh, city clerk of Albany; topic, "The Amended Laws Governing Hunting Licenses." Discussion opened by Mose W. Simson, city clerk of Tonawanda. 7.30 p. m.—Theater party, Empire theater.

Friday, August 17, 9 a. m.—Auto trip around city, visiting various points of interest. 1.30 p. m.—Special car to Lake George, then taking boat through the lake to Paradise Bay, returning to Glens Falls about 6 p. m. 8 p. m.—Topic, "Agricultural Law, Relative to Dogs." Discussion opened by Peter Collins, city clerk of Mount Vernon. Topic, "How City Clerks of First and Second Class Cities Are Aiding the Government During the War Crisis." Discussion opened by Daniel J. Sweeney, city clerk of Buffalo. Topic, "How City Clerks of Third Class Cities Are Aiding the Government During the War Crisis." Discussion opened by Grover C. Yerdon, city clerk of Johnstown. Presentation of resolutions.

Saturday, August 18, 10 a. m.—Topic, "Marriage License Law." Discussion opened by C. Milton Allen, Jr., city clerk of Fulton. Topic, "Municipal Ac-

(Continued on page 168.)

PERSONALS

Duffy, Frank J., former deputy fire chief of New York city, died August 3 at his home in Brooklyn.

Dunnen, Henry, has resigned as city engineer of Jackson, Ky. William Smith has succeeded him.

Longley, F. F., a member of the firm of Hazen and Whipple, has been made a major and sent to France to assume complete charge of the water supply for the American forces.

Middleton, G. M., has resigned as road engineer for Shelby county, Ky., to take effect Nov. 1.

Mulock, M. B., has been appointed superintendent of the Joliet, Ill., water department, succeeding John W. Graham, who has resigned.

Scott, Winfield, mayor of Enid, Okla., formerly a major in the First Oklahoma Infantry, is in the officers' reserve training camp at Fort Root.

Sherman, LeRoy K., formerly a member of the Illinois State River and Lake Commission, has opened offices as consulting engineer at 137 So. La Salle street, Chicago.

Taylor, Dr. W. B. R., has been appointed member of the park board of Schenectady, N. Y.

Wells, George, has been appointed chief highway engineer of Pike county, Ky.

Wood, A. B., engineer for the New Orleans Water and Sewerage Commission, has been retained as consulting engineer by the sanitary district of Chicago.

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

TRACTOR-TRUCK.

Lapeer Equipment for All Types of Hauling.

The claim for superior efficiency and economy of the Lapeer tractor-truck is based on the advantages of pulling a load rather than carrying it. The tractor-truck consists of two separate units—the tractor which hauls and the trailer which carries the load. It is claimed that transportation costs are reduced to one-half of the usual costs of motor hauling. With one trailer, the 5-ton Lapeer tractor-truck has an average weight of 3,500 pounds, as against 10,000 pounds, the average weight of a 5-ton motor truck. The use of tractors also reduces idle time in loading, an important factor in the economy of operation. The same size tractor is used to carry any size load, only the size of the trailer being changed. This makes the use of the tractor very convenient when different types and weights of load are handled. All kinds of trailers may be used: dump bodies, for sand, cement or other construction materials; stake bodies for pipe, lumber, etc.; underslung bodies for heavy, bulky loads such as machinery, etc.

The tractor-truck can be handled very easily in traffic. It can be turned around in its own length, can turn sharp corners in crowded streets or can be backed against a curb with the tractor at right angles, taking up very little room. Attention and maintenance and repair expenses are much reduced because road shocks and stresses due to the load are absorbed principally by the trailer.

The trailer can be attached or detached in a minute, without the aid of an extra man. The front of the trailer is fitted with rollers that run over an inclined track on the tractor. The trailer also has a standard which drops

down and keeps the body level when detached from the tractor. In coupling, the tractor is backed to the trailer, the rollers meet the inclined track and the tractor is then backed under the trailer until the coupling hits the stop. One pin is then inserted and the coupling is completed. The equipment is fitted both with a turn-table and a draw-bar attachment, so that either two or four-wheeled trailers may be used. Ordinary wagons may be satisfactorily used as trailers. Both the draw-bar and turn-table connections



"MODERN" METER BOX TOP.

are through coil-springs that take up the stress and strain when starting or stopping.

The tractor has a very comfortable cab, which affords entire protection to the driver. It has a ventilating, rain vision wind-shield. The windows may be lowered into the doors, and those at the sides may be lowered into the body, making driving perfectly cool and comfortable in summer. The doors may be removed in a few moments.

The motor is a Waukesha, 4 cylinder, $3\frac{1}{2} \times 5\frac{1}{2}$ stroke; separate head; three-point suspension; cylinders cast en bloc. There are three main bearings. The governor is built in. Lubrication is by pump and splash. Cooling is by centrifugal pump, radiator and fan. The

ignition is high tension magneto, fixed spark.

The clutch is multiple disc, dry plate. The transmission is selective sliding, three speeds forward and one reverse. The steering is left hand side, irreversible type—gas control on wheel—accelerator pedal on foot board. The brakes are on rear wheels—service, contracting; emergency, expanding.

The frame is of 5-inch channel steel. The rear axle is Torbensen internal gear. The weight is carried on I-beam dead axle. There are roller bearings throughout and all gears and bearings are fully enclosed and run in oil. The front axle is I-beam, drop forged, roller bearings throughout. The wheels are wood, front 34 x 4 inches in both sizes and rears, 34 x 5 inches in 2-3 ton size and 34 x 6 in $3\frac{1}{2}$ -5 ton size. The weight is 3,050 pounds. The wheel base is 90 inches.

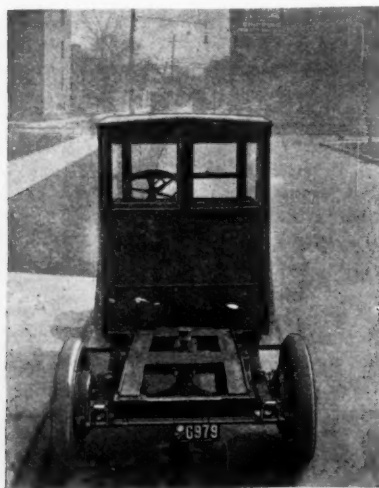
There are four sizes of the tractor-trucks, 2, 3, $3\frac{1}{2}$ and 5 tons. The accompanying illustrations show the tractor and views of the turntable coupling and the rear of the tractor (showing track). The equipment is made by the Lapeer Tractor-Truck Company, Lapeer, Mich.

METER BOX TOP.

"Modern" Housing Cover With Valuable Features.

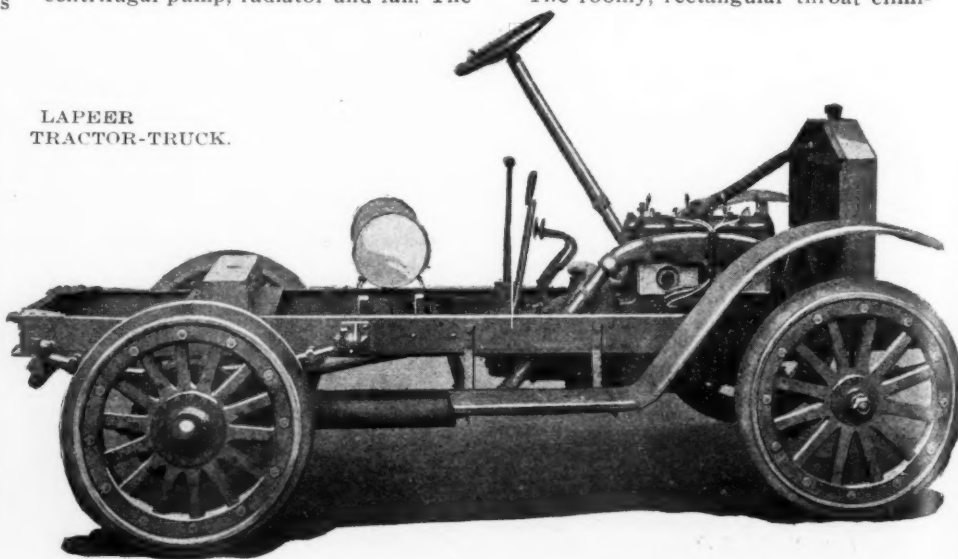
The "Modern" meter box or housing top has a number of new features claimed to make it automatic, quick-opening and trouble-proof. The two outstanding points in construction are the rectangular throat and the locking device, both of which should be appreciated by the meter setter, particularly if he has experienced the usual difficulties.

The roomy, rectangular throat elimi-



Rear of Lapeer Tractor.

LAPEER
TRACTOR-TRUCK.



nates the inconveniences encountered in the use of tops with small round openings. It is easier to fit brick to the square faces of the throat; the job looks neater when it is finished; and because brick does not have to be broken, the work will be more permanent and require less repairing. The reinforcing rib around the outer edge of the top adds much strength without increasing the weight—in fact, it allows the use of a lighter casting, resulting in a saving in first cost, freight, etc. In order to make the top universal in meeting all the usual requirements, it is furnished either with or without an inner lid.

The locking device is designed practically to eliminate any possibility of being stolen, and it cannot be lost in shipment, use or otherwise. The top part, that which is engaged by the wrench, is galvanized malleable iron. The bottom of the locking part, which comes in contact with the iron casting, is bronze. This makes the lock resistant to tendencies to rust, corrode or stick. To unlock, the key is given a half-turn and the cover is raised almost half an inch and stays there. This is a particularly useful feature in reading meters after a sleet or rain storm in freezing weather. No hammer, screw driver, pick or shovel is necessary for opening this housing top. It is practically self-opening and it stays open until it is relocked.

The size of the cover is standardized and is made to fit a tile measuring 18 inches in diameter inside. The accompanying illustration shows the top, which is made by the Modern Iron Works, Quincy, Ill.

INDUSTRIAL NEWS

Cast Iron Pipe.—Prices continue at the record high levels of the last few weeks. While private buying continues to some extent, only a few cities are making the best of the situation and buying for urgent needs. The pipe demands of the army cantonnments are about filled. Quotations: Chicago—4-inch, class B and heavier, \$68.50; 6-inch, \$65.50. New York—4-inch, class B and heavier, \$68.50; 6-inch, \$65.50. Birmingham—4-inch, class B and heavier, \$63; 6-inch, \$60; class A, \$1 extra.

The Walter A. Zelnicker Supply Co., St. Louis, Mo., has just published a new bulletin, No. 221. This lists exceptional offerings in rails, locomotives, cars, cranes, pipe, piling and tanks. Copies of the bulletin are free for the asking.

Standardized Truck Building for U. S.

The committee on automotive transport of the Council of National Defense has announced that, as an outcome of a conference of motor-truck manufacturers, engineers, representatives of the Quartermaster Corps of the Army and the committee held at Columbus, Ohio, the results of which have since been approved by the War Department, the truck makers of the country have agreed voluntarily to co-operate with the War Department in car-

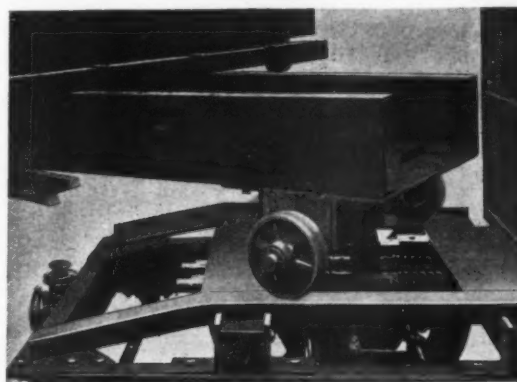
rying through a continuing standardized truck-building program for the requirements of the American Army. The Columbus meeting was attended by fully 2,000 representatives of the industry, and its action, according to the committee, insures the organized assistance of the country's truck makers in providing an ample supply of military trucks for Government service.

For immediate service in France, the Government either already has ordered or will place orders in the near future for enough trucks of modified commercial type to take care of the first expeditionary forces. Even after the standardized truck is approved, such orders will be continued, so that the fullest possible use will be made of

LAPEER TRACTOR-TRUCK.

Connection Between Tractor and Trailer, Showing Turnable Coupling.

(Note track and wheels for easy coupling.)



trucks of types now in the service of the Allies, which some American firms are now building.

In the meantime the Secretary of War has set aside from the contingent fund a sum sufficient to complete the work of standardizing parts for a military truck, based on the best American and foreign experience, which will serve in the future as the standard American Army truck. Much of this work already has been carried out voluntarily by the members of the Society of Automotive Engineers, co-operating with the officials of the Quartermaster Corps. It is hoped that under the new authorization of the War Department the entire work of designing and testing will be completed before January 1 and that construction of the new standardized trucks can then begin.

The experts of the Quartermaster Corps, together with their civilian advisers, have reached the conclusion that it is only by a thorough standardization program, by which manufacturers of parts can all be turned to making the same interchangeable designs, that the Army can be assured of ample supplies for possible greater demands on the capacity of the industry in the future. It is pointed out that not only will the demand for trucks grow as more American troops go abroad, but that, if future allied offensives should drive the fighting more into the open, more rapid and extensive supply transport facilities will be needed. The standardized truck whose design is finally to be completed under the department's authorization will be entirely suitable for commercial purposes, as

well as being the best military truck yet designed.

The Hydraulic Pressed Steel Co., Cleveland, O., announces with extreme regret the death of Otto P. Stehn, general sales manager. He was about forty years of age and had been connected with the Hydraulic Pressed Steel Co. for six years.

The Atlantic Refining Company, 3144 Passyunk avenue, Philadelphia, Pa., is publishing a very unusual series of advertisements in a magazine of general circulation, the purpose of which is to acquaint the nation with the resources, industries and points of touring interest in the Keystone state. All organi-

zations in the state have been asked to co-operate to make the visitor welcome. An excellently prepared and illustrated booklet, entitled "Motoring Through the Keystone State," is sent to all requesting it. The Atlantic Refining Company is being congratulated on all sides on the fine spirit displayed in its broad-gauge advertising campaign.

The American-LaFrance Fire Engine Company, Elmira, N. Y., announces the receipt of the following orders: Albia, Iowa, Type 40 combination with junior pump; Atlantic Highlands, N. J., Type 40 combination with junior pump; Boyne City, Mich., Type 40 combination with junior pump; Cicero, Ill., Type 40 combination with junior pump; Cleveland, Ohio, Type 12 pumping engine; Cleveland, Ohio, Type 31 65 ft. aerial truck; Corvallis, Ore., Type 12 pumping engine; Greenwich, Conn., Type 75 pumping engine; Highland Park, Ill., Type 17 75 ft. aerial truck; Louisville, Ky., 2 Type 10 combination chemical engine and hose car; Louisville, Ky., Type 31 65 ft. aerial truck; Marion, Ind., Type 75 pumping engine; Montclair, N. J., 2 Type 40 combination chemical engine and hose car; Norwalk, Conn., Type 14 service truck; Peekskill, N. Y., Type 75 pumping engine; Richmond, Ky., Type 40 combination with junior pump; Rock Island, Ill., Type 12 pumping engine; Sacramento, Cal., 2 Type 12 hose cars; Sacramento, Cal., Type 75 pumping engine; Stockton, Cal., Type 12 pumping engine; Titusville, Pa., Type 40 combination with Junior pump; Watch Hill, R. I., Type 75 pumping engine; U. S. Government, 3 Type 75 pumping en-

gines; Atlantic Highlands, N. J., Type B Brockway combination chemical engine and hose car; Atlantic Highlands, N. J., Type A Brockway combination chemical engine and hose car; Burlington, Ia., 2 Type B Brockway combination chemical engine and hose car; Etna, Pa., Type B Brockway combination chemical engine and hose car; Hanover, Pa., Type B Brockway combination chemical engine and hose car; Pulaski, N. Y., Type D Brockway combination chemical engine and hose car; Stillwater, Minn., Type 12 combination and Brockway Type D combination; Alamosa, Col., Brockway Type D chassis; Savanns, Ill., Brockway Type D combination; Hartford, Conn., Type 12 combination chemical engine and hose car; West Hartford, Conn., Type 12 triple combination chemical engine and hose car; Thomaston, Conn., Type 40 combination with Junior pump; West Hoboken, N. J., Type 31 75 ft. aerial truck and Type 12 triple combination; West Berwick, Pa., Type 40 combination with Junior pump; Milton, Mass., Type 12 triple combination; Old Forge, Pa., Type 12 combination; Utica, N. Y., city service truck; Marblehead, Mass., Type 14 combination service truck; South Bethlehem, Pa., 2 Type 12 triples; Battle Creek, Mich., triple combination car; Willmar, Minn., Type 12 combination with Junior pump; Cohoes, N. Y., Type 12 combination and type 12 triple; Harrisburg, Pa., Type 31 tractor; Bethlehem, Pa., Brockway Type D combination.

Electric Plant in India.—An English firm at Madras, Messrs. Best & Co. (Ltd.), has applied to the government of Madras for a license for the supply of electric energy within the municipal limits of the town of Madura, Madras presidency. The terms of the license indicate that the power to be supplied is principally for lighting, fan and heating purposes and that street lighting is to be established in at least 36 streets, but there will be a supply for industries also. The town of Madura, with a population of 134,130, and situated 344 miles south of Madras on the main railroad route to Ceylon, is one of the most important in southern India. Madura of late years has been developing commercially, due to its favorable position on the railway. American manufacturers of electrical supplies interested in the possibility of furnishing supplies for the new undertaking should address Messrs. Best & Co. (Ltd.), First Line Beach, Madras, India. This firm, among other connections, are local agents of the American and India line, of which Messrs. Norton & Lilly, Produce Exchange Building, are New York agents.

The Goodyear Tire & Rubber Company, Akron, O., has just issued a booklet on Maximum Mileage, which tells "How to Get the Most Out of Your Tires." The new booklet is the result of years of experience in building miles into tires, and, it says, should its message be heeded and put into practice, three-fourths of our annual waste in

tires could easily be saved. The foreword invites the tire user to take advantage of the service that Goodyear service stations are equipped and anxious to render in the interest of tire economy. The booklet deals with the tire, the road, proper loading, inflation pressures, wheel alignment, changing of tires, the various items of proper tire care and the use of tire savers in prolonging tire life. Many valuable suggestions are advanced which every motorist might capitalize. Among these are the testing of air pressures to insure service, the avoiding of bumps which cause breaks on the inside of the tire where its pressure is unknown until the announcement comes in the shape of a blow-out, the proper use of chains, the right way to carry tubes, the proper application of brakes and many other important considerations to which tires are entitled. There is a very interesting chapter on the Tire Saver Kit, which is a collection of tire accessories designed to take care of any unexpected tire trouble on the road. The Maximum Mileage booklet may be secured at any Goodyear Service Station or by writing to the company at Akron.

PROBLEMS CITIES ARE STUDYING WITH EXPERTS

Goodrich, N. D., is to build a **WATERWORKS SYSTEM**. Plans and specifications were prepared by T. R. Atkinson, engineer, Bismarck, N. D.

BRIDGES being constructed by Brookfield twp., Seneca, Ill., were planned by G. L. Farnsworth, Ottawa, Ill.

SEWERS and a **SEWAGE DISPOSAL PLANT** are to be built by Seymour, Ia. The engineer for the work is M. G. Hall, Centerville, Ia.

Oxford, O., is to make a number of **STREET IMPROVEMENTS**. The engineers consulted on the work are the L. A. Boulay company, 1248 Nicholas building, Toledo, O.

Montezuma, Va., is making a number of **STREET IMPROVEMENTS**. The consulting engineer for the work is Arthur Pew, Forsyth theatre building, Atlanta, Ga.

A **WATERWORKS SYSTEM** is to be built by the town of Throckmorton, Tex. The consulting engineer for the work is Henry Exall Elrod, Interurban building, Dallas, Tex.

Eureka, Kans., is to improve its **WATERWORKS**. Plans for the work are being prepared by Black & Veatch, 507 Interstate building, Kansas City, Mo.

Logan county, Guthrie, Okla., is to improve about 30 miles of **HIGHWAYS** and to build 15 **BRIDGES**. The engineers for the work are Peckham & Wilkins, 606 Majestic building, Oklahoma city, Okla.

NEWS OF THE SOCIETIES

(Continued from page 165.)

counting." Discussion opened by John P. McNamee, city clerk of Troy. Topic, "The Election Law." Discussion opened by Henry M. James, city clerk of Hudson. Two-minute discussion by each city clerk on what his city has accomplished during the past year; election of officers; choice of convention city for 1918; final adjournment of business sessions.

Utah State Firemen's Association.

At the annual convention of this association, held July 26 and 27 at Ogden, W. S. Horan of Park City was elected president, succeeding Harry Elmer of Mammoth. Other new officers are: First vice president, Chief George A. Graves of Ogden; second vice president, N. C. Simonsen of Brigham City; secretary, T. L. Hatch of Springville, re-elected; treasurer, Reuben Simpson of Salt Lake, re-elected.

W. T. Ayland of Salt Lake was re-elected a trustee and E. D. Anthony of Salt Lake was reappointed state organizer. Brigham City was selected as the next convention city.

A sanitary **SEWERAGE SYSTEM** is to be constructed by Abingdon, Va. The consulting engineer for the work is Robert Gray, Bristol, Va.

Some **STREET IMPROVEMENTS** being made by the borough of Carnegie, Pa., were planned by O. B. Higley, 424 South avenue, Pittsburgh, Pa.

A **SEWERAGE SYSTEM** is to be built by Ventura, Cal. Plans are being prepared by Olmsted & Gillelen, Hollingsworth building, Los Angeles, Cal.

WATERWORKS improvements are being made by Waverly, Ia. The engineers for the work are the Iowa Engineering Co., Chase block, Clinton, Ia.

Dundas, Ont., is improving its **RESERVOIR**. The consulting engineer for the work is E. H. Darling, 604 Spectator building, Hamilton, Ont.

The city of Dorval, Que., is to construct a new **FILTRATION PLANT**. Plans for the improvement were prepared by Dupont, Roy & Baudouin, Montreal, Que.

PAVING IMPROVEMENTS for Collingswood and Oaklynn, Pa., have been planned by Remington & Vosburg, 6th & Market streets, Camden, N. J.

In making some **STREET IMPROVEMENTS** in connection with its housing experiment in Lowell, the state of Massachusetts has the consulting services of Kilham & Hopkins, 9 Park street, Boston, as architects and of Arthur C. Comey, 24 Abbott building, Cambridge, as landscape architect.